

TWEED'S
POULTRY-KEEPING
IN INDIA

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Brown Leghorns.

Leghorn

TWEED'S POULTRY-KEEPING IN INDIA

A simple and practical book on their care and
treatment, their various breeds, and the
means of rendering them profitable

SIXTH EDITION

Revised and brought up-to-date

BY

Mrs. M. V. LORD

ILLUSTRATED

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PREFACE TO THE SIXTH EDITION.

WITH the increase of poultry-keeping in India, there is, naturally, a demand for literature that deals comprehensively, and in a helpful, straightforward manner with the subject.

Since the first edition of this book was published, many people from the European, Anglo-Indian and Indian communities in this country, have become interested in poultry-keeping. Some of these have made a profitable business of it. Others have obtained great pleasure from it as a hobby. Numbers more are taking it up every year. Caste prejudice is slowly breaking down, and in all parts of the country people are finding how easy it is to keep fowls profitably, if they are housed and fed in the right way.

TWEED'S POULTRY-KEEPING IN INDIA has been a standard in this country for many years. The popularity of the earlier editions, and the high reputation attained by the book, have been well-deserved. It would be hard to find a book more helpful in every way, and more suited to the climatic conditions prevailing in this country.

The talented author having retired from India, the publishers have entrusted me with the preparation of the present edition.

Later methods of housing and feeding have made it necessary for some alterations and additions to be made, but I have endeavoured to keep all that would be of any assistance to the novice, or the established breeder of many years' standing.

The addition of the coloured plates will make the book even more interesting and attractive, as they give the standards up to which all fanciers should endeavour to breed. Even from the best of birds every chicken hatched will not attain perfection, but the higher we aim the higher we attain and with a definite standard before us and perseverance and patience to back us up, the poultry of India will soon be able to hold their own throughout the world.

For a large number of our many and varied illustrations we are indebted to The Poultry Press, Ltd., for their generous loan of blocks ; also for their kindness and courtesy to us in general.

We trust that the sixth edition of this book will provide a pleasant and profitable study for all who are interested in poultry-keeping and breeding in India.

M. V. LORD.

POULTRY MAGAZINES AND JOURNALS.

THE following Papers are recommended to those wishing to keep in touch with matters concerning poultry-keeping. It should be remembered, however, that while those published out of India are quite reliable when describing poultry, their diseases and cures, yet climatic differences make their advice as to housing and feeding applicable only to those living in the hills of India.

Australian papers, and particularly the Queensland ones, are useful to dwellers in the plains.

INDIA.

Indian Poultry Gazette. Mission Poultry Farm,
Etah, U. P.

GREAT BRITAIN.

Poultry. Weekly, 2d.

Poultry World. Weekly, 2d.

The Feathered World. Weekly, 2d.

Utility Poultry Journal. Monthly, 6d.

Scottish Poultry News. Weekly, 1½d.

Poultry Gazette. Monthly, 3d.

viii *POULTRY MAGAZINES AND JOURNALS.*

Eggs. Weekly, 2d.

National Poultry Journal. Weekly, 2d.

Poultry Club Year Book. 2s. 6d.

Poultry World Annual. 2s.

Poultry Keeper's Annual. 2s.

Poultry Keeper's Journal. Monthly, 6d.

Poultry Keeping. Weekly, 1d.

Poultry News. Weekly, 2d.

AUSTRALIA.

Poultry Journal. Monthly.

Messrs. Thacker, Spink & Co. will be pleased to procure any of the above. Correspondence invited

LIST OF ILLUSTRATIONS.

	PAGE.
Fig. 1. Plan of Model Poultry-house and Run ..	16
„ 2. Model Poultry-house and Run for India <i>facing</i>	16
„ 3. Rhode Island Red Hen	} <i>between 18 & 19</i>
„ 4. Rhode Island Red Cockerel	
„ 5. Pair of White Wyandottes ..	<i>facing</i> 24
„ 6. Black Wyandotte Hen ..	28
„ 7. Plan of Poultry-house and Shed ..	32
„ 8. Australorp Hen ..	} <i>between 38 & 39</i>
„ 9. Australorp Cock ..	
„ 10. Pair of Buff Langshans ..	<i>facing</i> 43
„ 11. Pair of Silver-spangled Hamburgs ..	47
„ 12. Pair of Rose-comb Brown Leghorns ..	51
„ 13. Points of the Light Sussex ..	58
„ 14. White Indian Game, American Type	<i>facing</i> 61
„ 15. Pair of Dark Brahmas, American Type	64
„ 16. Pair of Buff Cochins, English Type ..	67
„ 17. White Wyandotte Cock ..	70
„ 18. Pair of Light Brahmas, English Type }	} .. 75
„ 19. Light Brahma Cock, American Type }	
„ 20. Croad Langshan Cockerel ..	81
„ 21. Pair of Houdans ..	84
„ 22. White Hyderabad Game Cock ..	87
„ 23. Pair of Black-red Indian Game ..	89
„ 24. Exhibition Black Orpington Cock ..	92
„ 25. The Points of the Fowl ..	96
„ 26. Pair of Buff Orpingtons ..	<i>facing</i> 101
„ 27. Silver Campine Hen ..	105
„ 28. Pair of Golden-laced Wyandottes ..	107
„ 29. Pair of Silver-laced Wyandottes }	} .. 111
„ 30. Silver-laced Wyandotte Cock }	
„ 31. Pair of White Rose-comb Leghorns ..	115

LIST OF ILLUSTRATIONS.

			PAGE.
Fig. 32.	White Leghorn Pullet ..	}	<i>facing</i> 123
" 33.	White Leghorn Cockerel ..		
" 34.	White Leghorn Cock ..	..	125
" 35.	Faults in Poultry Combs ..	..	129
" 36.	Pair of Buff Leghorns ..	..	<i>facing</i> 133
" 37.	Pedigree Chart ..	..	135
" 38.	Black-tailed White Japanese Bantam	..	<i>facing</i> 147
" 39.	Method of Testing Eggs ..	..	151
" 40.	White Wyandotte Cockerel	}	<i>facing</i> 168
" 41.	Utility White Wyandotte Hen		
" 42.	White Plymouth Rock Cock ..	..	174
" 43.	Brooder and Run ..	..	181
" 44.	House and Run for Chickens ..	}	187
" 45.	Coop with Covered Run attached for Chickens		
" 46.	Rose-comb Minorca Cockerel ..	..	<i>facing</i> 191
" 47.	Black Rose-comb Bantam ..	..	199
" 48.	Bantams and Bantam Pens ..	..	207
" 49.	Gold Sebright Bantam ..	..	<i>facing</i> 212
" 50.	Hyderabad Game Hen ..	..	216

LIST OF COLOUR PLATES.

			PAGE.
Brown Leghorns ..	..	<i>Frontispiece.</i>	
White Orpington ..	..	.. <i>facing</i>	12
Rhode Island Reds ..	..	..	36
Light Sussex ..	..	..	54
Gold-spangled Hamburgs ..	..	..	78
Black Minorcas ..	..	..	94
Spangled Old English Game ..	..	..	118
Anconas ..	..	..	140
Specked Sussex ..	..	..	160
Silver-laced Wyandottes ..	..	..	180
Black Rose-combed Bantams ..	..	..	194
Modern Black-red Bantams ..	..	..	218

CONTENTS.

CHAPTER	PAGES
I.—PLEASURE AND PROFIT OF KEEPING AND BREEDING POULTRY :—	
The Fascination of Poultry-breeding ; Begin in a small way ; Women and Poultry-keeping	1—12
II.—THE GROUND SUITED FOR POULTRY-REARING :—	
Soil ; Shelter ; Shade	13—16
III.—FOWL-HOUSE, SHED AND YARD :—	
Space needed ; The House ; The Shed ; The Yard ; Construction ; Roof ; Ventilation ; Door ; Floor ; Perch ; Laying Nests ; Shed ; Dust Bath ; Lime ; Yard ; Light ; Water-vessels ; Trap-door ; Cleanliness ; Rats ; Snakes	17—31
IV.—FOOD :—	
Quality of Food ; Change of Food ; Quantity of Food ; Frequency and Regularity of Feeding ; Preparation of Food and Mode of Feeding ; Water ; Lime ; Sharp Grit ; Care of Cook Birds ; Cost of Food ; Housing ; Feeding	33—47
V.—THE SELECTION OF BREEDS :—	
Object in keeping Poultry ; Delicate Breeds ; The Best Layers ; The Largest and Most Weighty Birds ; The Most Hardy Birds ; The Best Table Fowls ; Eggs ; Non-Sitters ; The Best Sitters and Mothers ; The Best	

CHAPTER	PAGES
Breeds to Keep ; Other Indian Breeds ; A Profitable Method ; The Best Crosses ; The Way to Improve the Common Country Fowl ; Poultry-breeding in India ; The Number of Breeds to Keep ; Advantages of a Single Breed ; Poultry for the Table ; Egg Production	48—71
VI.—THE DIFFERENT BREEDS OF FOWLS :—	
Brahma ; Cochín ; Langshan ; Rock ; Wyandotte ; Houdan ; Malay or Chittagong ; Aseel or Indian Game ; Ghagus ; Orpington ; Silkie ; Dorking ; Minorca ; Campine ; Hamburg ; Leghorn ; Ancona ; Sussex ; Rhode Island Red ; Faverolle ; Malines ; Imported Poultry ; The Best Breed ; Size ; Buying Eggs and Fowls ; Pure-bred or Cross-bred ; Egg Production and Fertility	72—108
VII.—BREEDING :—	
The Art of Breeding ; The Parent's Influence ; Stock Birds ; Proportion between Cocks and Hens ; Number of Hens to a Cock ; How to Manage Cockerels ; Kept Separate ; The Colony Plan ; Mating for Colour ; Cross-breeding ; Crowding ; Care and Feed ; How to Know the Best Layers ; How to Know the Age of Birds ; Fat Hens ; The Scientific Selection of Breeding Stock ; Influence of the Male Bird ; An Egg Type	109—136
VIII.—EGGS AND HATCHING :—	
When Hens Lay ; The Best Time to Set Hens ; Selection of Eggs ; Selection of the Mother ; Purchasing Clucked Hens ; The Nest ; How to Treat Sitting-Hens ; How to Treat the	

CONTENTS.

xiii

CHAPTER	PAGES	
<p>Eggs ; Number of Eggs under a Hen ; How to Keep Eggs ; How to Treat Eggs which have Travelled ; Putting the Hen off the Cluck ; How to Pack Eggs ; Purchasing Eggs ; To Buy Eggs or Birds ; Eggs for Setting ; Day-old Chickens ; Breeds and Utility ; Purchasing Fowls</p>	137—168	
<p>IX.—REARING CHICKENS :—</p>		
<p>The First Feed ; How Often to Feed Them ; What to Feed Chickens on ; Water ; Green Food ; Animal Food ; Grit ; Mixture of Food ; Colour of Chickens ; Neglect ; Clipping Wings ; Examine the Vent ; Over-feeding ; Brooder and Run ; The Run ; Shade ; Crows and Kites ; At Night ; Kept Separate ; Injurious Practices ; Ground ; Cleanliness ; Vermin ; Wet and Damp ; Perch ; Coops and House ; Weeding out the Stock ; Things you ought to Know</p>	169—191	
<p>X.—ARTIFICIAL HATCHING AND REARING BY HAND ;</p>		
<p>BOX FOSTER-MOTHER</p>	192—199	
<p>XI.—MANAGEMENT OF LARGER CHICKENS ; CAPONISING ; MANURE ; FATTENING FOWLS ..</p>		200—208
<p>XII.—THE INFLUENCE OF CLIMATE ON DOMESTIC</p>		
<p>FOWLS</p>	209—219	
<p>XIII.—DISEASES OF POULTRY</p>		220—266
<p>RECIPES</p>	267—272	

TWEED'S

POULTRY-KEEPING IN INDIA

CHAPTER I.

PLEASURE AND PROFIT OF KEEPING AND BREEDING POULTRY.

POULTRY-KEEPING in India can be divided into three classes. First, we have the person who stocks and runs a large farm for a living, or to augment a small income. Then, we have the person who keeps his poultry as a hobby, but with the idea of obtaining some return from it, and last of all, we have the person, who, for the love of the fowls themselves, and the pleasure to be derived from them, pursues his hobby, irrespective of what it may cost him.

It is a proved fact that poultry-keeping can be made a profitable business in India. People who give their time and labour to it, in the way that they would do to any other business, are well repaid, for there is a growing demand for larger and better eggs, and a better class of poultry for the table.

As the breeding and rearing of poultry in this country is almost entirely in the hands of poor and ignorant Indians, it is not surprising that the eggs supplied to the market are small, and the fowls that come to our tables, poor in quality and flavour. Some years must necessarily elapse, before this state of affairs can be appreciably altered, in spite of what is being done to improve matters.

Who does not enjoy the luxury of a large, newlaid egg, or the meat of a fine, fat, tender fowl? Is there anything more delicious, or more nutritious to be obtained? Then, why is it, that so few people will give their time and labour, towards the production of these things?

Some people seem to imagine that poultry-keeping is only suitable for the working-man, and consequently degrading to their own social standing. If these people can eat and enjoy poultry and eggs, why should they consider it beneath their dignity to produce them? Any householder is justly proud of a well-kept fruit or vegetable garden. Can he not be equally proud of a well-kept fowl yard?

In England, men and women of good birth own and run poultry farms, and find great pleasure as well as profit in their business. Hundreds of others keep a few fowls for their own use, and find an equal pleasure in their hobby. Naturally, we learn to love what we

work for, and whether we keep fowls as a business or a hobby, we soon learn to look on them as pets, to be cared for, and provided with all that is necessary to make them healthy and happy.

It is surprising that the several Governments in India do not do more to forward the poultry industry in this country. Naturally, they would require money to supply better stock, to replace some of the miserable specimens that at present roam about and pick up a living as best they can. Besides this, it would be advisable to give some sort of training to the ignorant people who would be the recipients of the fowls supplied. A constant oversight of the birds would also be necessary for a few years, and that would be an added expense ; but the increase in the country's egg-production alone should more than repay the money used. Bigger and better eggs mean more nourishment to the consumer ; and surely the health of the people should be a Government's first consideration.

Missionary societies, too, could do a great work for good among their converts, by training them to run small poultry farms. It would be far more satisfactory for these people to stay on the land, and make a living there, than, as would-be clerks, etc., to swell the number of unemployed in the cities. "Back to the land," is the cry in the Colonies, and surely a country must profit by a movement such as this.

There are a great many Europeans and Anglo-Indians in India, who have small incomes, and find it difficult to maintain their families under the increased rate of living. To these people, a pen of good fowls would be an added source of income, "for a penny saved is a penny earned" and the value of the eggs received, would far exceed the expense of feeding; while the work of looking after the birds, could be entirely undertaken by the members of the family. Children can do a great deal towards this, although it would not be wise to leave them without supervision. Being young and enthusiastic, they do not tire of their work, but learn to love it more and more as they get older.

Well-to-do parents long for good, fresh eggs to give to their children. These are very difficult to obtain in a country where the heat is so great, that the eggs are often spoiled before they are gathered. Why do not these people keep fowls to supply their needs? Surely any parent, who has his or her children's welfare at heart, would not think it too much trouble to rise half-an-hour earlier in the morning, to feed and attend to a few fowls. How excited a child is over a present of a really fresh egg! while the joy of picking one up, fresh from his own pet hen, is only excelled by the happiness with which he proceeds to eat the same egg, after it has been nicely prepared for him. Why do not more parents give this pleasure to their children, whose

little appetites require so much tempting, when the hot weather is slowly sapping their strength and energy ?

Many people have failed in their attempts to keep poultry. Often they have blamed the country, sometimes they have blamed the fowls, but seldom have they blamed themselves ! What has really been the trouble ?

Fowls need attention. Reliable servants are hard to find and when found we discover, probably, that a former master or mistress has, by constant supervision, instilled in them the right methods to adopt. Even good servants are not infallible and the only wise course for a person to pursue, is to devote a certain time, daily, towards the feeding and care of the fowls.

It is impossible to make a success of poultry-keeping unless one's fowls are well-housed, well-fed and supplied with a sufficient quantity of good drinking water. Cleanliness in all things is essential. How can hens lay eggs when they are uncomfortable ? How can they produce them when they are ill-fed ? Nothing is derived from nothing ; and only by careful attention to these essentials can one be successful.

For beginners, the wisest plan to adopt is to keep only one breed, or at the most, two. If two pens are kept, one should be of light breed and the other of heavy breed birds, as, by this means, a more regular supply of eggs is obtained. Begin with one cock and

four to six hens in a pen. Procure a copy of this book and read it carefully. Make a study of the breed you have, and do your best in caring for the birds. Your success will be assured. Begin in a small way, and gradually increase if you so desire. By this means, you will be prepared for any emergency that may arise.

THE FASCINATION OF POULTRY-BREEDING.—There is a strong fascination in the breeding and rearing of poultry. Men and women of all classes pursue it with unbounded enthusiasm. Some exhibit, some do not. Some sell their superfluous stock and eggs, others never take money, but prefer to give away what they do not require, to friends who are less fortunate. Whatever the circumstances, seldom does a fancier give it up entirely. The fascination is a strong and lasting one. Even in old age will men and women talk proudly of the birds that they have owned and kept.

What is the secret of this fascination ?

Decidedly, the greatest factor of all is the beauty of the fowls. Many and varied as the breeds are, they find their several admirers. One person favours a highly-coloured fowl. Another enjoys the sight of a pure-white bird, with its contrasting red comb and wattles ; while still another admires the beautiful sheen on a black one. Fancy breeds with their long graceful tails, topknots, or other characteristics, call

forth exclamations of delight from even the old stagers. The larger the bird, the more it appeals to one person ; while the quick, active movements of the light breeds, fascinate another.

Even the combs and legs of the birds have their own particular fanciers, for while the straight, upright comb appeals to most of us, the fancy combs of the Wyandottes, Buttercups, etc., still have their supporters.

Never are we at a standstill, and the steady, systematic crossing and developing of the breeds we have at present, will result in new and greater beauties, to gladden the hearts of all poultry-lovers.

Another of the secrets of this fascination is to be found in the love for living things. A child loves its doll, but if it is given a kitten or a puppy—something that is alive—it quickly transfers its affection to the living creature. Men are but grown-up children after all, and this feeling survives, even in the adult. We never outgrow it ; we may change the object of our affection, but the love for living things still abides. So, in the life of the poultry-yard, from the little ball of down with beady eyes which emerges from the egg, to the fully-developed fowl, pleasure is found. The ways of these feathered dependents, the courage and gallantry of the cocks, the motherly instincts of the hens and the perky inquisitiveness of the chickens

afford a pure and healthy pleasure. The varied language of the poultry-yard is a study in itself, and one can see how delightful an essay may be written on it by reading Gilbert White's *Natural History of Selborne*. Then, too, the growth of the chicken from the time it is hatching until it assumes the *toga virilis*, the varying changes in size, shape and coloration, afford a perennial charm.

Still another of the secrets of this fascination, which has a stronger hold upon the more intellectual breeders, is the opportunity to study the laws of life. The great problems of biology are helped in their solution by the student who breeds poultry. The beginning and progress of life in the egg; the relation of growth to food and other elements; the laws of variation and heredity, the effects of inbreeding and outbreeding, all find illustration in this pursuit.

The development of different breeds, whether derived from some common ancestor, or the result of many special creations, can be studied to great advantage in the poultry-yard. Indeed, it is not extravagant to say that there are few, if any, better fields for such investigations; and the more thoughtful and observant of breeders are almost necessarily led into the consideration of these great questions. Some of these questions intrude themselves upon the attention of every breeder, even the least thoughtful and observant, for his breeding

operations cannot be carried on successfully without at least a superficial knowledge of these particular laws of life. In this way every breeder becomes, in some degree, a student of biology, and finds in this study an intellectual pleasure and benefit. The beauty of it all is that, unlike so much human knowledge, this knowledge comes by a royal and easy road. There are no burnings of the midnight oil, no aches of the weary brain, only the simple joy of outdoor observation.

All these things combine to produce this wonderful fascination, but probably the greatest factor of all consists in the power that man finds himself able to exercise over these lives, in moulding them to his will. This one cause, alone, would be an ample explanation of the fascination of poultry-breeding. Fowls possess a constitution of wonderful plasticity. As the variations appear from year to year in breeds, either through the natural tendency to vary, or through that tendency multiplied by the matings made by man, the breeder seizes upon such as suit his purposes, and thus modifies, improves, changes and transforms the diverse characteristics of his flocks, as his aim and purpose may be. Old breeds are improved, new breeds are created. Man is here exercising a power that seems to him to be somewhat akin, however far removed in degree, to the creative power of his Maker. The exercise of

this power gives him a sense of his greatness, as compared to the lower orders of creation ; and assures him of his own importance in the workings of this great universe of ours. Such are some of the causes which help to explain the great fascination of poultry-keeping, a fascination which seems never to lose its power over the man who has once fallen under its influence. Circumstances may compel him to give up breeding fowls, but the contemplation of their charms, the study of the laws of life, and the admiration for the work of the most skilful breeders remain. These are a present possession that nothing can divest him of. In sickness or health, in poverty or wealth ; amid the cares of a busy life ; shut in by brick and stone walls, where fowls are never seen, he still can enjoy the remembrance of the fowls he has bred, and the knowledge he has attained.

BEGIN IN A SMALL WAY.—Success or failure with poultry, depends upon the poultryman himself. There are good opportunities of making money with poultry, and many ways of saving money by judicious arrangements and close attention to details, but for a beginner to suppose that, because he is provided with a certain amount of money and can secure a likely-looking place for business, success is certain, is a mistake that may result in disappointment. Although at first matters may seem easy, the undertaking may sooner

or later end in a very sad awakening to the reality of a hopeless failure. We often buy our experience dearly, and for this reason it is better for us to gain our experience before launching out into the deep and risking our all on untried waters. As an adjunct to a business that does pay, poultry-keeping could be begun on small lines and gradually increased, until it becomes more and more profitable and later on becomes an all-sufficient and exclusive business. Make haste slowly, and do not expect to learn in a few months what has taken other men years of hard work and experience to attain. It is by far the best to make up your mind which particular breed of fowls will best suit your requirements, and keep only to that breed until you have made a success of it. Then another breed might be tried and so on until one is satisfied that the best possible results are being obtained.

WOMEN AND POULTRY-KEEPING.—It is an accepted fact in most parts of the world, that women make the best poultry-keepers. One reason for this is their attention to detail. This is a most important factor in poultry-keeping, as in other businesses. There are hundreds of ways of saving or wasting money in and around a poultry farm or yard. Usually a woman has more time at her disposal than a man, and can see to the proper feeding of the fowls, the cleansing of the various utensils, and the necessary sweeping and

tidying. It is not necessary for a woman to spend her whole day in the hen-house ; nor is it necessary for her to undertake duties that are distasteful to her. In India, servants are easily obtained, and with oversight and proper instruction they can be directed to care for the fowls in the proper way. Half-an-hour out-of-doors in the early morning would be sufficient for the ordinary poultry-yard to be tidied ; the birds fed and watered ; and everything left ready for the day. Children also would benefit from the interest that would be aroused in them, by the care of these living creatures. Fowls need kind treatment, and women and children are more ready with their kindnesses, as a rule, than men. Perhaps this is because they have more vivid imaginations. It needs a woman's imagination to realize what a bird must be feeling like on a hot day, without a cold drink ; or on a bitterly cold night without sufficient protection from the biting wind. Again, the sight of a nest full of soft fluffy chickens will always arouse the mother instinct in a woman's heart ; and a fellow-feeling for the hen-mother in her watchful care of her helpless little ones, will stimulate her to do all she can to make the little family happy and comfortable.



White Orpington

CHAPTER II.

THE GROUND SUITED FOR POULTRY-REARING.

SOIL.—Poultry can be kept with varied success all over India, but any portion of the country where the soil is sandy, gravelly, and abounding in *kunkar*, with a good proportion of lime or chalk in it, and with a natural drainage, is admirably adapted to the rearing of fowls, especially so where the rainfall is not excessive. The more elevated, porous, and well-drained the soil is, the better. Stony ground, however, is bad for fowls as it hurts their feet and causes bumble-foot. The heavier the soil is, and the more it retains moisture, the worse will it be for the fowls that have to stay on it. Marshy, dirty, or badly-drained grounds are fatal to fowls. The side of a hill with a south or south-east aspect makes an ideal poultry-run.

SHELTER.—Poultry must be sheltered from the sharp, cold, north and east winds, and from heavy rain.

If they are allowed to walk about in water and puddle, or be chilled by the cold winds, they will not thrive. During the cold weather and rains the north of the shed must be kept closed, and movable screens put upon the west and east to protect from the cold and rain at night.

SHADE.—Poultry need to be protected from the midday sun, and the hot winds during the hot season. There should be a shed and a number of large shrubs and trees for shade to protect the fowls from the heat. During the hot weather the west side of the house and shed should be closed during the day and opened at night. The south and east are the coolest during the hot season, and should be kept open. A large number of birds are killed by the heat. Unless sufficient shade is provided for the birds, they will suffer and die.

The best trees for shade are the Mango, Jack, Nim, Lime, Pumalo, Lichee, Star-apple, Rose-apple, and Jamon. Where there are no trees, some should be planted immediately. The Mango grafts, Lichee, and Jack should be planted thirty feet apart. The Pumalo, Lime, and Nim should be planted only fifteen feet apart. It is a good plan to plant clumps of *Hibiscus* or Plantain

four feet apart, on the four sides of the yard. On the hills there should be trees enough to give shelter to the birds. The bare side of the hill is most unsuitable for poultry.

Until the trees and shrubs grow sufficiently large to afford enough shade, some other plan must be adopted to provide shade for the birds. A shed, from ten to fifteen feet square, made of bamboo and straw, and raised on bamboo posts three feet from the ground, should be made in a convenient and high part of the run. The posts should be put a foot-and-a-half into the ground, and there should be a good thick layer of straw on the shed. This shed is best placed on the east of the poultry-house. The ground under the shed should be raised and properly drained. In a large run a number of small sheds should be made.

Where it is not possible to erect a shed in this way, a good plan is to have a wooden house, and raise it on small stone pillars, about two feet from the ground. The ground beneath the house should be raised a few inches to ensure good drainage. This takes the place of the more elaborate shed, in a run where it is necessary to conserve space.

PLAN OF MODEL POULTRY-HOUSE AND RUN.

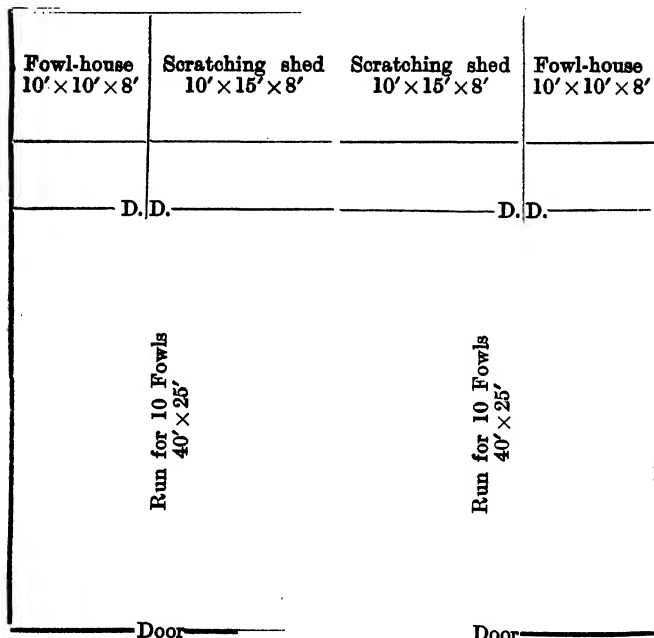


Fig. 1.

If desired for a larger number of fowls, the runs should be increased accordingly. The houses and sheds would supply sufficient accommodation for at least 40 fowls in all, but it would be advisable to double the runs for the same number, if possible.

The galvanized iron at the bottom of the fence is sunk six inches into the ground, to ensure against rats. Above the iron is a strip of half-inch mesh wire-netting, to guard against snakes and the destructive mongoose. Two-inch mesh wire-netting completes a most practical and serviceable fence, which should reach a height of at least six feet six inches.

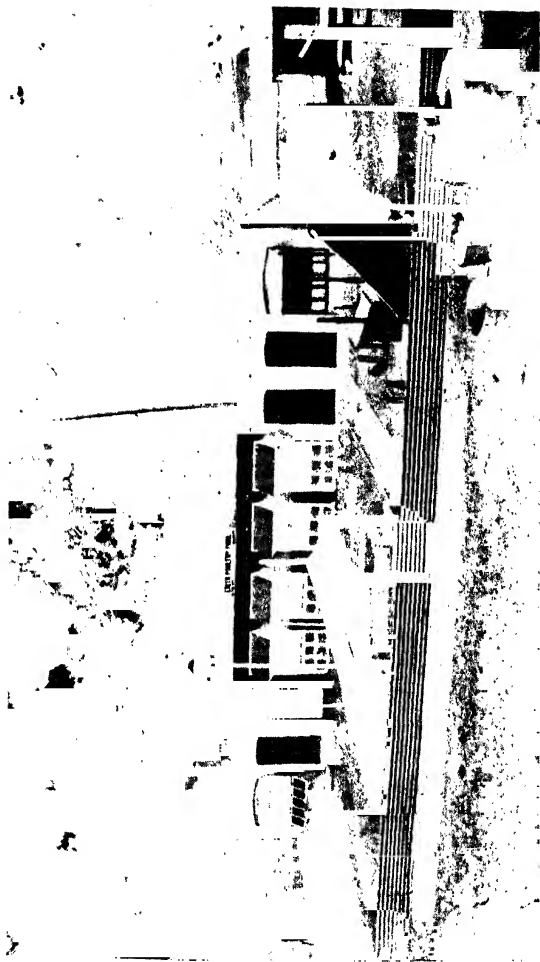


Fig. 2.—MODEL POULTRY-HOUSE AND RUN FOR INDIA.

The glass windows are fastened up at night, or in wet weather. There is a small door between each house and scratching shed, to allow the birds to go in to lay. Windows on the south and north cause a current of air and ensure a cool house. Care must be taken to make these high enough from the ground, so that the birds will not be directly in the draught at night. The glass windows must be closed in wet or very cold weather. A tube-well supplies good pure water.

CHAPTER III.

FOWL-HOUSE, SHED AND YARD.

SPACE.—Fowls can be kept on the intensive system in the hills of India, but it is not advisable to try this in the plains. There, they need a run of some sort, as much for the fresher and cooler air to be had in the early morning and late afternoon, as for the exercise to be obtained. They must never be crowded under any circumstances; nor must they be kept in close confinement. The more space allowed them, the better. Close confinement is fatal to poultry.

The House.—Each adult fowl requires at least twenty-five cubic feet of space. A house six feet long, five feet wide and five feet high, will accommodate six birds comfortably. To crowd any more into a space like this would be to sacrifice the health and happiness of the birds, and hinder the production of eggs.

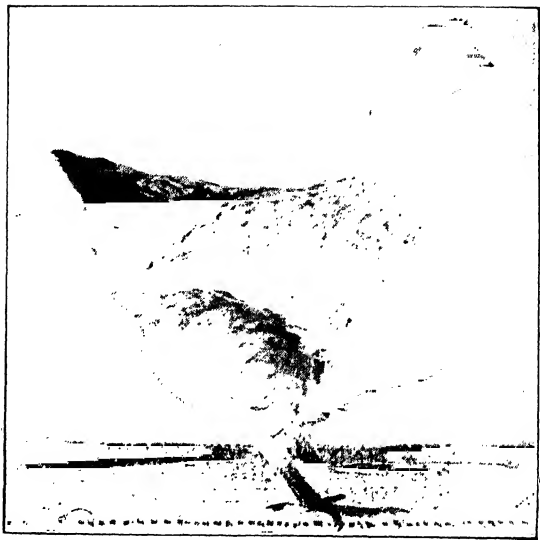
The Shed.—There ought always to be an open shed or verandah attached to the fowl-house to serve as a shelter for the birds from rain and the midday sun.

The shed should be, if possible, as wide and twice as long as the house, but if it be the same size, it will be sufficient.

The Yard.—This must be left to the convenience of the poultry-breeder. Sometimes it is impossible to have a large run. In such a case a small one will answer the purpose, providing the birds are supplied with a good scratching litter in the shed ; plenty of green food ; animal food in some form or other ; grit and lime.

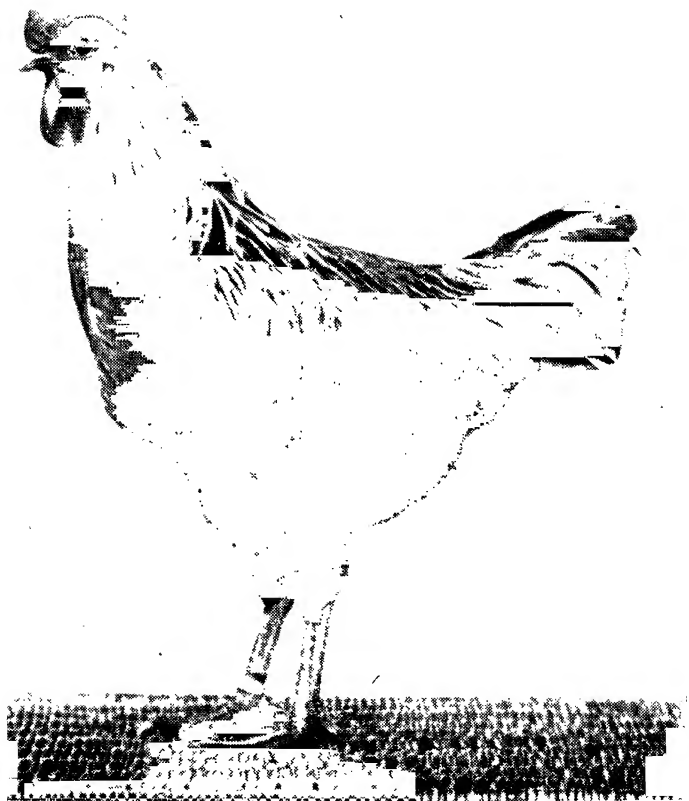
Perhaps the ideal plan for the small breeder is to give his birds the run of his compound, whenever possible. They will find all these necessities for themselves and will be healthier and happier, as it is more natural for them.

Where this is not possible, as large a run as is convenient should be provided. About a hundred square feet per bird is quite satisfactory, but twice that amount is better. Some breeds of fowls are quarrelsome, and unless sufficient room for roaming is provided the more energetic of them will worry the weaker and smaller ones, and deprive them of their food. They have even been known to peck them, until the poor unfortunate birds have had to be destroyed.



RHODE ISLAND RED HEN.

Fig. 3.



RHODE ISLAND RED COCKEREL.

Fig. 4.

For a pen of six birds and a house similar to that mentioned above, a run measuring forty feet by thirty feet is recommended, as that would give the birds ample room to spread themselves over the grass, without coming into too close contact with each other.

CONSTRUCTION.—The fowl-house should be built of either brick, wood or mud walls. If of brick or mud, it must be made smooth and whitewashed with lime both inside and out ; if of wood, the interior should be painted with a mixture of seven parts kerosene oil and one part tar, and the outside painted first with kerosene oil and then with white paint or whitewashed with lime. Never put tar to the top or outside of a wooden house ; it will make the house terribly hot.

A serious objection to mud walls is that they are convenient for rats to make holes in, and for snakes to lodge in.

The house ought always to open to the south. During cold nights the house should be closed on the north, east and west, opening only on the south, but during the hot weather and rains the west and east should be kept open also.

The size of the house will, of course, depend on the number of fowls to be kept. It is advisable to have several small houses rather than one large one, as in case of an epidemic breaking out, the only chance of saving at least part of the stock is to be able to prevent any communication between the different sets of birds. No house should be more than twenty feet long and six feet wide or ten feet by twelve feet and six to eight feet in height. This will hold about thirty fowls.

Roof.—The roof of the house may be made of either *pucca* work, thatch or wood, but never of corrugated iron or tin unless there is plenty of shade to prevent it from becoming hot. Other materials have been proved to give good service, such as Malthoid Roofing, Italit, etc. Italit is the most convenient as it does not need another roof to support it. There should be no open space between the roof and walls for cats, rats or snakes to get in by. If corrugated iron be used for roofing, a good layer of thatch or mortar could be put over it or wood under it.

Ventilation.—If built of brick or mud the south side of the house ought to be enclosed with half-inch mesh wire-netting ; on the north, east and west, high up near the roof, there should be some openings, twelve inches by

six inches, covered with the same kind of wire-netting. This will afford perfect ventilation at all seasons, and the house will not be too warm in the hot, or too cold in the cold season.

Door.—The door of the house ought to be on the south, and made of a wooden frame covered with half-inch mesh wire-netting. The size of the door should be in proportion to the house, but always large enough to allow a man to conveniently get through.

Floor.—The floor of the house ought always to be *pucca*, well beaten down and plastered or cemented. On the floor there should be coarse sand or dry earth. Put at least three inches deep. Phenyle or kerosene oil should be frequently sprinkled on the sand and earth. The droppings on the sand must be removed every morning, and the sand changed every three weeks or a month. During the cold weather straw may be used on the floor, but straw helps to breed vermin. Before being used it should be steeped in phenyle and water and well dried. It must be frequently changed.

Perch.—Inside of the house, eighteen inches from the wall, running parallel to the walls, there should be perches twelve or eighteen inches from the ground. The perches should be made of good strong wood, three

inches in width, rounded off at the edges. These perches should be fitted with tick-proof brackets, to protect the birds against their worst enemy—the tick.

Laying Nests.—Earthen *gumlas*, eighteen inches in diameter and nine inches deep, should be placed in the corners of the house for the hens to lay in. One *gumla* will do for three hens. Dry ashes, sand or sifted earth should be put six inches deep in the *gumla*. Unless laying nests are provided, the hens will lay on the ground or in some place where the eggs are apt to get broken or be stolen. Nest boxes affixed to the house, if of wood, are very convenient and to be recommended, as they do not retract from the amount of floor space in the house. However, these must be kept very clean, or they will become infested with lice. By using a *gumla* and ashes instead of a box and straw you will prevent vermin. Put some flowers of sulphur or tobacco leaf-stock with the ashes.

Shed.—During the rains, fowls will not thrive if they are confined entirely to the house ; or allowed to constantly walk about in the wet and damp. A shed must be attached to the house ; the east and west sides closed up with wire-netting, the north leading into the house, and the south enclosed with wire-netting and a door in the centre.

If desired, the shed may be placed to the east or west in a line with the house. The roof of the shed should be either *pucca*, wood or thatch, attached to the house and sloped down to the south or west. The floor of the shed may be plain mud, covered over with a good three inches of fine gravel or broken bricks and old plastering. The door of the shed on the south ought to open into the yard.

The gravel on the shed floor must be changed every month or two, and the earth dug up a foot or two deep and turned over once in six months.

On the floor of the shed put several inches of good scratching litter. Feed the grain into this litter regularly, as by scratching for their food in this way, the fowls will get the exercise that they need to make them lay, and keep them healthy.

Cut straw makes quite a good scratching litter. Dry leaves are also good, and are, generally, easily obtained. Still a better litter is made from fresh stable manure, dried in the sun. This should be mixed with an equal quantity of finely cut chaff, with a good sprinkling of lime and flowers of sulphur spread over it, and then all mixed well together. This litter will keep perfectly sweet for from four to six months.

The litter should never be less than four inches deep and six inches is better.

Dust bath.—A *gumla* or a hole in the ground, two feet in diameter, should be filled with dry, clean, sifted earth or ashes and placed in the shed on the east side. This *gumla* should be continually refilled. Flowers of sulphur should be added to the ashes. Coal ashes or cowdung cake ashes should be used.

Lime.—A small *gumla* filled with broken old sand plastering, old lime and mortar, or pounded bricks, slaked lime and flint grit, should be placed in the shed on the west side.

Instead of this, a box or *gumla* of coarse shell grit can be kept in the house or shed. This supplies the necessary grit, and the lime that is so essential to the formation of the egg-shell.

Yard.—The yard should be enclosed with one-and-a-half or two-inch mesh wire-netting. The height of the fencing will depend upon the size and breed of the fowls. The Brahma, Langshan, Plymouth Rock, Orpington and Cochin and other heavy breeds, will need fences only five feet high; Game, Wyandotte and Chittagong six feet high; and smaller breeds,



PAIR OF WHITE WYANDOTTES.

Fig. 5.

from six to ten feet. It is preferable to make the fence only six feet high and cover the top of the enclosure with two-inch mesh wire-netting but this is rather expensive. There ought to be plenty of green grass on the yard. Every six months at least, half the ground in the yard should be properly dug up and turned over, and some kind of grain, such as wheat, mustard, sunflower, etc., sown on it. The best time to dig up the yard is after the rains. If done before the rains, the ground must be well raised and properly beaten down, or else it will become soft and retain water. Do not disturb the soil during the rains. When only one breed is kept, and there is a wall or fence round the compound of the house, there is no need for an enclosed run ; the fowls may be allowed the freedom of the compound. Fowls thrive well and lay better when allowed a free and large range. Hens allowed perfect liberty lay more eggs than do hens confined in small runs. The eggs of fowls on free range hatch better than do eggs of fowls confined in small runs. These facts should always be borne in mind when making a poultry-yard.

If the soil in the yard is unsuitable for poultry, the following method should be adopted to improve it :— Dig out the ground about six inches deep and throw twelve inches deep of sand, *kunkar*, old mortar and plastering and lime over the earth, mix properly, beat

down and level so that no water can lodge on it. Coal ashes are very good to put down on the ground. They should be mixed with the *kunkar* and plastering. The ground must be properly rolled and grass allowed to grow on it. Fowls will thrive in such a yard if it is properly drained.

Never allow decayed vegetable matter, cowdung, horse-dung, etc., to remain in the poultry-yard. Dirt and filth of any kind are a fruitful source of disease, and will work havoc among the poultry. No decomposed matter or excrements of any kind should be allowed to remain where the poultry are.

Light.—Light is just as essential to the well-being of poultry as is fresh air. The fowl-house must never be built in a dark, gloomy corner, or on the north or east side of another building, or directly under trees. Plenty of sunshine is absolutely necessary; without it fowls will take cold, become mopish, and die.

Water-vessels.—A vessel with clean and fresh water ought to be placed in the yard or near the shed door. Always keep the water in the shade. If allowed to remain in the sun, it will become hot and will prove injurious to the birds. Sun-warmed water causes cholera in fowls.

Trap-door.—A small trap-door, twelve inches high and ten inches wide, should be attached to the door of the fowl-house. The door can be kept locked, but the trap-door must be left open during the day to allow the hens access to the laying nests. The door of the shed opening into the yard should be kept partly open during the day when the weather is fair. One has to guard against servants and crows, and also dogs and rats, stealing eggs from the nest.

For people who have not the means or room to make a proper fowl-house, the following method can be adopted. Make a box six feet long, four feet wide and four feet high, enclosed on four sides with board; the top and front being covered with half-inch mesh wire-netting. The top must be fixed with hinges, to lift like the lid of a box. The front must have a door about a foot square, made of wood and wire-netting, to let the birds in and out. In the centre, six inches from the bottom, a perch must be run, from the back of the box to within a foot from the front.

This box is placed in a shed, or back verandah. It holds a cock and four to six hens, and is quite safe from cats, rats and jackals.

The box must be kept very clean, and have a good layer of sand or earth on the wooden bottom. It must

be swept every day, and the box and perch frequently painted with a mixture of kerosene oil and tar.

The fowls are kept in the box at night and let out in the compound or yard during the day. An earthen *gumla*, filled with ashes, is placed in one corner of the box during the day for the birds to lay in, and the small door is kept open to allow them to get in.

CLEANLINESS.—Cleanliness is an absolute necessity. The house and shed must be swept every day, and every particle of the droppings removed. The yard, also, must be kept thoroughly clean, and nothing offensive allowed to remain.

The water-vessels must be thoroughly scrubbed daily and the water changed twice a day.

At all seasons of the year, but especially during the rains, vermin breed rapidly in a fowl-house. The *gumlas*, perches and all the woodwork must be frequently cleaned and painted over with a mixture of kerosene oil and tar, or washed with a strong solution of phenyle.

The sand on the floor of the house and the gravel on the shed-floor must be changed as directed above.



BLACK WYANDOTTE HEN.

Fig. 6.

The ground in the shed and yard should be dug up and turned over twice a year.

The food and water must be good and clean.

The walls inside of the house and shed should be painted with kerosene oil or whitewashed with quicklime and carbolic acid every two or three months.

RATS.—Rats are a great nuisance in a fowl-house. If they are allowed to get into the house, they will cause irreparable damage. They have been known to steal eggs and chickens, and kill fowls four and six months old. Besides that, they carry disease into a fowl-house. If the walls and flooring of the house be made of good *pucca* bricks and concrete, the rats will not give much trouble, but there is no way of keeping them out of a house made of mud or mats, unless the following plan be adopted :—Lay down half-inch mesh wire-netting on the floor, and run the wire-netting up the sides of the wall for about three feet. Over the wire-netting on the floor place four inches of dry sifted earth or sand, and put some cowdung and earth-plaster over the wire-netting on the sides of the wall. Corrugated-iron sheets may be used instead of wire-netting. By this means rats can be most effectually kept out of the house.

Another good way of making a rat-proof flooring is this : dig up the earth to a depth of twelve inches, remove all the earth and fill in the space to a depth of six inches with sand or coal cinders, pour in a lot of water and ram it down, over the sand or cinders put broken stone or rock and mix with pitch or asphalt, and ram down until you get a firm smooth surface. No rat will get through this. The stone or rock should be broken into pieces not larger than two-and-a-half inches in diameter.

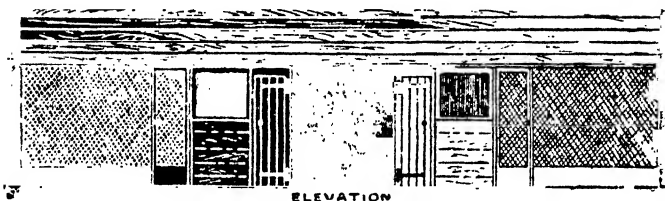
Broken glass can also be spread on the floor of the house before putting down the broken brick to make a *pucca* floor. This is most effective, as no rat can possibly burrow through glass that cuts its nose.

It is no use trying to get rid of rats by poisoning them. The fowls will get at the poisoned food or dead rats and insects, and die from the effects. The best thing is to catch the rats in traps and drown them.

SNAKES.—Another enemy to guard against is the snake. Snakes get into the fowl-house through the rats' holes. A cobra in a fowl-house will kill half a dozen fowls in a few minutes, and perhaps cause a loss

of hundreds of rupees. The only way to keep snakes out of the house is to keep out the rats. It is easy enough to keep rats and snakes out of the fowl-house, but it is almost impossible to keep the runs and yards free from them. If large snakes get into the run, and the fowls attack them, the snakes will turn on the fowls and bite them. As a rule, fowls will not attack large snakes, but will kill and eat small snakes. If the little snake happens to be a cobra, *kerait* or Russel's viper and bites the fowl, the bird will die. A fine large game hen was found dead near the door of her house ; on examination, it was discovered that she had been bitten by a snake. Her crop was very distended, and on being opened a cobra thirteen inches long was found in it. She had attacked the cobra, killed and swallowed it, but the cobra had bitten her in the fight. The only way to keep snakes out of a run or yard is to constantly fill up the holes in the runs and clear away all the jungle and long grass. If some coal tar is poured into the holes and the mouth of the holes closed with bricks, rats and snakes will not get into them.

PLAN OF POULTRY-HOUSE AND SHED.



PLAN

SCALE.

Fig. 7.

- A A Roosting and laying-houses ($10' \times 10'$).
 B B Fenced-in covered shed ($10' \times 20'$).
 C C Shed and run for sitting-hens.
 D D Grass runs. (For 30 fowls, $100' \times 30'$.)

- a a* Nests.
b b Perches.
c c Trap-doors.

CHAPTER IV.

FOOD.

THE fowls' food is one of the things that need the most careful attention. Any neglect or mistake in this matter is sure to cause serious loss.

QUALITY OF FOOD.—The quality of the food must be the best. It is no economy to feed on damaged grain and meal, or rotten meat, potatoes and vegetables. Bad food will engender disease.

Of all grain wheat is certainly the best for poultry.

The grain, whole or coarsely ground, and the coarse *atta* and bran are most excellent food for both young and full-grown fowls.

Barley is also good, but fowls in India do not readily eat the whole grain ; it should be ground into meal and mixed with wheat meal and skimmed-milk or butter-milk.

Oats, beans, peas and gram are all very good for poultry.

These grains should be crushed before they are given. The oats should be steeped and properly hulled before they are given to the birds.

Indian-corn is very fattening, and must not be given exclusively, or very often to poultry kept for breeding, or to growing birds, but it is very good for fattening fowls.

Rice has the least value of all grain. It has only seven per cent. of flesh-forming substance and a mere trace of bone-making substance. It must not be given to young and growing birds or to breeding stock, except in small quantities during hot weather, and then alternated with wheat, barley or oats. Paddy is very much better than rice, and is good for the birds in the hot weather.

Boiled rice is good for sick fowls and weak chickens.

Skimmed-milk, butter-milk, and curds are good for fowls, and should be given mixed with ground wheat and barley.

It has long been known that butter-milk is one of the best drinks for invalids and in fact for the average person, but very many who are interested in poultry never seem to realise its value as a drink or food for poultry. Butter-milk contains about the proper amount of lactic acid necessary to induce perfect digestion. It may also take the place of meat to a great extent. It keeps the fowls in a laxative condition, and at the same time furnishes considerable valuable, readily digested food. In preference give it to them in vessels, but if soft food is given them, butter-milk may be used

instead of water to mix it with. The fowls are very fond of it, and it has proved as valuable for the hens to induce egg-laying as for the chicks which are making flesh, bone, muscle and feathers at one and the same time and which need a varied diet of the most nourishing foods. It makes the fowls plump and the flesh light-coloured, tender and juicy. As it has proved to be such a great aid to digestion, it is not more than could be expected that fowls which have access to buttermilk are less subject to cholera or diarrhoea, and this has through years of experience proved to be so.

Skimmed-milk is an excellent food and drink for young chicks, and it may be given them freely at all hours, the only thing necessary being that the vessels in which it is supplied should be kept clean by frequent scouring.

Potatoes are good for fattening fowls, but should be given very sparingly to laying hens. When given to laying hens or growing stock, potatoes should be thoroughly boiled in their skins, the skin removed, then properly mashed and mixed with equal part of wheat-bran. Fowls should not be allowed to eat the skin of potatoes.

Fowls need some animal food to supply the waste in their system. Meat of sorts and fresh cut bone or bone-meal ought to be given once a week. Fresh bones, ground finely and mixed with meal, should be

given as a substitute for meat. All refuse food, such as scraps of meat, bread-crusts, potatoes, vegetable, rice, *dall*, curry, etc., from the table and kitchen, should be gathered together, cut up fine and given to poultry.

Green-food is an absolute necessity. Fresh tender grass, onions, garlic, cabbage, lettuce and carrots are excellent. Nothing tends more to keep fowls in health and good condition. The lack of it will injuriously affect the birds and cause the eggs to be poor in quality.

All green-food should be given uncooked. It can be cut up very finely and mixed with bran and *atta* to form a mash, or it can be placed in racks made of wood or tin for the birds to pick at. Cabbages and lettuces can be hung from the roof by a string, just high enough from the ground for the birds to jump for. About $2\frac{1}{2}$ feet is a good height.

Hemp seed, mustard seed and linseed given occasionally in small quantities during the cold season, rains and moulting time are very beneficial, especially to growing birds.

Never feed poultry entirely on paddy and rice, or they will not thrive. If large well-grown birds are wanted, they must not be fed, only, on such food. It may be given to Bantams when the object is diminutive size. The village *moorgi* has nothing better than paddy, and that is one of the reasons why they are so inferior in size. If paddy be used as an article



of food, it should be alternated with good sound wheat, gram and animal food. Every second meal should be wheat or gram, and some meat should be given twice a week.

CHANGE OF FOOD.—The food needs to be changed at the seasons of the year. During the cold weather fowls need more heat-producing and stimulating food—such as barley, oats, gram, peas, meat, etc. During the hot weather the birds need cooling food, such as wheat, paddy, butter-milk, and plenty of vegetable. It is best to give very little meat during the hot weather. During the rains, from the end of June to the end of September, especially when the birds are in moult, they need to be very carefully fed. Wheat, paddy, barley, gram, a small quantity of meat, onions, and some tonic in the food or water should be given, and plenty of vegetable.

QUANTITY OF FOOD.—It is no economy to starve poultry. They need an ample and regular supply of adequate food. It is also injurious to overfeed them. Overfed fowls are subject to many diseases from which properly fed ones are free, and cease to lay before the proper time, or are attacked by apoplexy on the nest.

It is difficult to give a fixed scale of food. Cochins will eat twice as much as many other breeds, and different birds of the same breed often have very different capacities for food. The same hen will eat

nearly twice as much when laying as when she is not laying.

The one simple rule with adult birds is to give them as much as they will eat eagerly, and no more. Food must never be left about. If food is allowed to lie about, a great deal will be eaten in excess, and a great deal will never be eaten at all. Sour or dirty food will engender disease.

The quantity of grain allowed for each fowl will depend upon the extent of the yard, and the quantity of scraps it receives from the kitchen and table, and also upon the seasons of the year. If the grass run be a large one, the fowls will forage for themselves and pick up a great deal of food. If the grass run be extensive and there be a fair quantity of refuse food, then each fowl will need on an average one chittack or two ounces of additional food every day. If the run be small, and there be not sufficient scraps, then two chittacks or four ounces will be needed. They will not thrive or less, and more will be injurious.

Then, again, the different breeds will need different quantities of food. The Cochin will eat twice as much as the Orpington or Wyandotte. The Cochin and Brahma need more than the other breeds.

Watch your birds. If they are not hungry at feeding time, they are getting too much to eat. If you find good grain lying about in the scratchin



AUSTRALORP HEN.

Fig. 8.



AUSTRALORP COCK.

Fig. 9.

litter, feed a little less, until they are able to eat it all. Give at least half the food as grain and make them scratch for it. The other half can be given in the form of table-scraps, wet mash, or dry mash. The latter is the easiest form of feeding and has this advantage :— Being dry, the birds must drink after every few mouthfuls and so are prevented from over-feeding, if the water is placed a little way from the dry feed hopper.

FREQUENCY AND REGULARITY OF FEEDING.— Fowls ought to be let out of their houses into the yard a little before sunrise unless the grass is wet, as they enjoy the cool fresh morning air. On being let out, the first thing they will do is to drink water. Fifteen minutes after they are let out they should be given their morning food.

This should consist of one ounce for each fowl, of good sound grain raked into the scratching litter. Three hours later the dry-feed hopper should be filled and the birds will peck and feed at it during the day. If preferred, a wet mash can be given at this time— about two ounces per bird. Another feed of grain, similar to the morning feed, should be given a little before sunset.

If more convenient, the two ounces of grain can be fed in the morning and the wet mash in the evening. Some might prefer to give the mash in the morning and the grain before the birds go to roost. Either of these

three methods can be adopted, as all have proved successful. The main thing to remember is to be regular. The birds soon learn when to expect their meals and are ready for them, if they are in good health, and are not being over-fed.

PREPARATION OF FOOD AND MODE OF FEEDING.—
The grain fed to the fowls can be varied from day to day, or it can be mixed and fed in that way.

Wheat, as stated before, is by far the best grain for fowls, but is inclined to fatten them if fed exclusively. Broken gram, maize, oats or barley should be used with it. Millet—generally known as *bajra*—is also good. A little paddy is beneficial at all times.

Thirty seers of wheat, ten seers each of paddy and broken gram, and five seers each of *bajra*, and broken maize makes a very good mixed grain for fowls. Oats or barley may be substituted for the gram or maize, if these are not obtainable. This mixture can be varied according to the time of the year. In hot weather a little more paddy and less gram and maize is advisable. Coarse oyster-shell grit can be added to this, in the proportion of five seers to every maund of grain, or the grit can be kept in boxes or tins where the fowls can help themselves as they wish.

The mash should be composed of good wheat bran and *atta*—preferably half of each with a little linseed added. Pea-flour and gram-flour can also be added in

small quantities. Fish-meal should be mixed with this about five seers to every maund of mash. This supplies the necessary meat for the birds and being easily assimilated is not so likely to cause indigestion. Fish-meal is becoming more known and more popular as a food for fowls. It is easily obtainable; easily kept; and easily given. It provides the birds with a good nourishing food, and increases the egg-production. Chickens thrive on it also, but it is better to start with only about half the quantity for them. This can be increased gradually until the birds have reached maturity. A little freshly-made powdered charcoal added to the food is very beneficial to both chickens and adult fowls.

If the above mash is to be given wet, only enough milk or water should be added to make it crumbly. Mix it well with the fingers until the moisture is evenly distributed, and the mixture can be pressed into a ball with the hands, breaking into crumbs when dropped again. Wet food is positively injurious to fowls. If it has become too wet, dry it off with a little wheat bran until of the right consistency.

Boiled carrots, turnips and beetroot or chopped lettuce and cabbage can be mixed with the wet mash. Onions and garlic can also be chopped fine and added. Fowls like a little salt in their food, but care must be taken not to give them too much. Dissolve the salt

in water and mix well into the food. One teaspoonful of salt is sufficient for thirty or forty adult fowls.

The mash should be placed in shallow dishes. These should not be allowed to remain in the run or shed for more than forty minutes, or an hour. If the fowls have not eaten the food by that time, feed a little less next day.

The dishes should be washed as soon as they are taken up, and put away for the next day.

WATER.—Fowls are thirsty creatures, and should be given plenty of pure drinking water. The water vessels must be scrubbed overnight and kept near the shed-door ready for use in the morning. Early in the morning before the fowls are let out, the vessels must be filled with water. The water must be changed again at 4 P.M. A few drops of Condry's fluid, E. C., Milton, or Douglas' mixture should be added to the water. Never leave the water in the sun.

LIME.—Lime is a necessary article of food for fowls. It supplies the substance for the egg-shells. If fowls are not allowed sufficient lime, they will not thrive, and will lay soft-shelled eggs. The lime must be slaked and mixed with sand or pounded brick, and placed in a box in the shed. Old lime-plastering will do very well.

Oyster-shell grit supplies both lime and grit for the fowls and is to be highly recommended.



PAIR OF BUFF LANGSHANS.
Fig. 10.

SHARP GRIT.—Sharp grit is absolutely necessary to the health of the fowl. A constant supply should be kept in the run near the feeding trough. The grit must be sharp. Blunt-edged grit will be of no use. If unobtainable, break up some old crockery, flint or rock with a hammer and pass the small pieces through a sieve. The sieve must be of one-eighth inch mesh. All that passes through this sieve will do well for the birds.

CARE OF COCK BIRDS.—It sometimes happens that unless the cock birds are given extra food a great percentage of the eggs are infertile. To place a box or cage in the pen, put the male bird in it and feed him separately with extra food is only a few minutes' work. Another way is to feed the hens in the shed, but leave the cock by himself in the house and feed him there. Care should be taken not to get him too fat.

COST OF FOOD.—The cost of feeding fowls varies much according to locality, management, and the price of grain. Never allow the food to be wasted. Buy good food and do not try to keep it too long. It will go mouldy and you will be obliged to throw it away.

If you trust your servants with the feeding of the fowls, either the food will cost about twice as much as it otherwise would, or the fowls will be starved. Personal care goes a great way in reducing the cost of keeping poultry.

HOUSING.—The following article by “A Practical Poultryman” about housing and feeding poultry will be of interest to all beginners :—

“The next question relates to the housing of poultry. Birds do not need warmth so much as air.

“Healthy hens will maintain better health when roosting in the trees in the most severe weather of winter than in faulty houses. It has been sometimes stated that the heat of the hen-house in winter is followed by the production of a larger number of eggs ; if such has been the case, we are quite satisfied that in the main the hens suffer in health.

“The hen-house should be built facing the south and so arranged that it catches the morning sun.

“Light appears to be contrary to the ideas of the old-fashioned poultry-keeper, whereas it is the enemy of disease, and specially of deadly microbic life. A perfect poultry-house should have no wooden floor, but a floor of earth laid upon at least eight to ten inches of cinders, broken bricks and gravel, and covered with a layer of sand, which will facilitate the daily removal of the manure with the broom. Cleanliness should be the first consideration. The house should be well ventilated but not draughty, and the door should be of wire-netting ; care being taken to prevent the birds being in a draught. It may be well whitewashed without and within ; lime-wash being used at least every

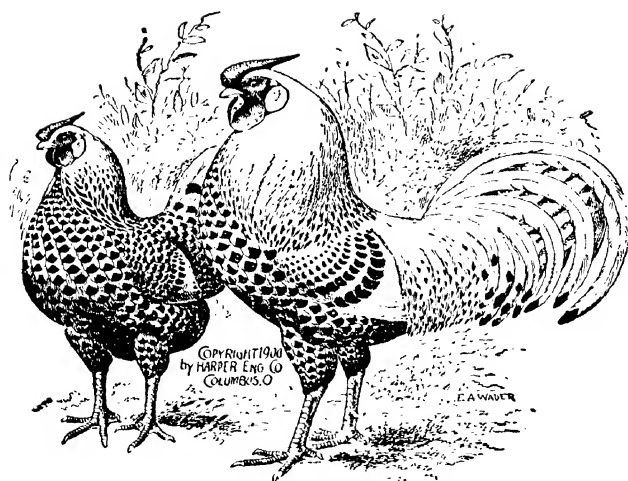
month, chiefly for the destruction of parasitic life. The best roof is thatch, for it is warm in winter and cool in summer ; whereas iron makes the worst form of roof. The house should be as large as possible, as over-crowding is fatal.

“The run or enclosure in which the birds are kept should be large also and well provided with shade.

“*Feeding.*—We now come to the question of feeding. Whether we intend to provide meat or eggs, we are bound to consider one fact, that both materials are composed of substances containing lime, fat or oil and albuminous matter containing nitrogen. Unless, therefore, these materials are supplied in the food in sufficient abundance, neither meat nor eggs can be manufactured to the fullest extent.

“In addition to these materials, the food of the hen contains starch, or its equivalent, sugar, gum or cellulose, these being the carbonaceous constituents of food and chiefly employed in combustion and the maintenance of the heat of the body. Now, it is possible to feed a hen on grain which provides her with more starch than she requires and less meat or egg-making material than is necessary. If this is done, as it may be by Indian-corn feeding, there must be waste of one constituent because there is not sufficient of another to carry the process further.

“ There is no doubt fowls require more of that class of food which is rich in nitrogen than they obtain, and for this reason we strongly recommend that, in addition to grain, animal food should be liberally provided. The best form of meat is that which is the least stimulating, such as the white meat of the intestines and the pouches of animals. It is more digestible than the average coarse muscle, more nourishing, and less costly and stimulating. The chief difficulty is in the process of cleaning and cooking, and this becomes the stumbling-block in the average poultry-yard, for it may be claimed by some at least that if all this labour is necessary the game is not worth the candle ; but the same remark applies to all other industries if they are to be carried out properly. The cheapest grain foods are not those which cost the least per maund, unless the weight of a cereal varies, but when we have reduced each cereal to equality of weight, we have still further to ascertain the proportion of feeding matter each cereal contains. Indian-corn, for example, contains more nutritious and digestible feeding matter per cent. than oats, so that at equal prices per maund Indian-corn is much the cheaper of the two ; and yet Indian-corn is not so typical a food as oats because of its larger proportion of starch. If, however, Indian-corn is used in conjunction with animal food, we can make the greatest use of it in the cold weather, and the remark applies equally



PAIR OF SILVER-SPANGLED HAMBURGS.

Fig. 11.

to wheat, which may be used almost in the same way. In 100 pounds of wheat there are about 77 pounds of digestible food as against 56 pounds in oats, and in estimating what food to use we are bound to take this fact into consideration. The best grain for both production of eggs and meat is wheat and oats given alternately, or, better still, oats ground together and given in the form of meal, and wheat given whole. During the hot weather paddy may be substituted for oats. We must not forget that all fowls require green-food, material for making the shell of eggs, and exercise."

CHAPTER V.

THE SELECTION OF BREEDS.

THERE are many breeds of fowls. Some are beautiful ornamental birds, well worthy the attention of fanciers who can afford to keep them for mere show. Some are both beautiful and useful birds, and can be kept profitably by all people with ordinary care and economy. Some are very delicate birds and do not thrive in India ; others, again, are hardy and not only thrive well but multiply rapidly.

OBJECT IN KEEPING POULTRY.—The selection of the breeds to keep will depend entirely upon the object with which fowls are kept. Some persons keep fowls as mere ornaments and pets ; others keep them for the benefit of the household, and use the eggs and fowls for the table ; others, again, keep them to breed from and sell. The class of people first mentioned generally select the most showy and expensive birds. The second and the third classes of people mentioned, would be wise if they combined their interests and kept only such fowls as will furnish ample produce for the consumption of the family as well as a surplus which can be readily sold

at a profit to help to defray expenses incurred in the upkeep of the poultry.

DELICATE BREEDS.—I will first mention some of the breeds that are very handsome, but are either too delicate for India, or unproductive, and consequently not worth the while of people who desire profit from poultry-keeping. Such are the different varieties of white-faced Spanish fowls; all the varieties of crested Polish fowls; the Crève-cœurs and Bantams. The Dorking is a splendid breed of fowls, but extremely delicate, and the hens are indifferent layers. The Houdan is a good general purpose fowl, but will not thrive in all parts of India. The climate of Bengal, Assam, and the Duars, where the rainfall is heavy, is quite unsuited to this breed. They may thrive better in the dry and nicer climate of the Punjab and the Central Provinces.

THE BEST LAYERS.—The Australorp, Wyandotte, Rhode Island Red, The Orpington, Langshan, Rock, Sussex, Brahma, Chittagong, Cochin, Game, are the best layers among the larger breeds. The Leghorn, Minorca, Andalusian, and Campine are the best layers among the smaller breeds.

All hens of the same breed do not lay alike. Some hens of the best-laying breeds are the worst layers, and some hens of the worst-laying breeds lay very well. Pure-bred birds of a good strain are capital layers.

When the birds are bred from only the best layers, and this is done year after year after most careful selection, the good qualities are established in the birds and the strain is made.

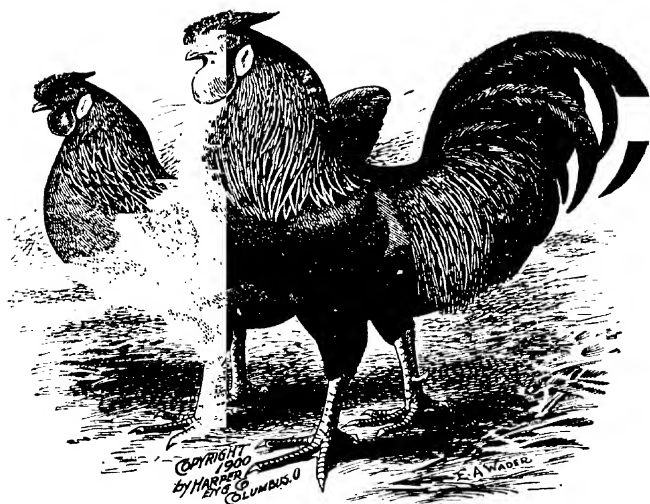
THE LARGEST AND MOST WEIGHTY BIRDS.—Brahma, Langshan, Orpington, Australorp, Rock, Chittagong, Wyandotte, Game, Cochin, Sussex, Rhode Island Red.

THE MOST HARDY BIRDS.—Brahma, Langshan, Chittagong, Orpington, Rock, Wyandotte, Australorp, Leghorn, Minorca, Sussex, Cochin, Game, Rhode Island Red.

THE BEST TABLE FOWLS.—Asseel or Game, Chittagong, Langshan, Wyandotte, Rock, Orpington, Sussex, Rhode Island Red.

EGGS.—There is an old and prevalent notion that dark-shelled eggs are richer than white-shelled ones and there can be no doubt that this is to a certain extent true, though by no means absolutely so.

Langshans, Game or Asseels, Plymouth Rocks, Brahmas, Cochins, Orpingtons, Rhode Island Reds, and Wyandottes lay the richest and darkest-shelled eggs, while the eggs of the Spanish and Polish varieties are the whitest of all. The eggs of the Bantam and Hamburg, though very small, are the nicest in flavour. A good-sized egg should weigh from two to two-and-a-half ounces, or from five to six tolas. Ordinary eggs,



PAIR OF ROSE-COMB BROWN LEGHORNS.
Fig. 12.

weigh less than one-and-a-half ounces each. Two-ounce eggs are a good average.

All hens of the same breed will not lay eggs of the same colour or size. Some Brahmas, Plymouth Rocks, Wyandottes, and Orpingtons lay white eggs, and some very dark eggs.

NON-SITTERS.—The Houdan, Leghorn, Hamburg, Minorca, Campine and Andalusian are non-sitters. When any of these breeds are kept, hens of some sitting-breed, or an incubator must be kept to hatch the chickens.

THE BEST SITTERS AND MOTHERS.—Silkies, Wyandottes, and some Bantams are the best sitters and mothers. The Brahma, Cochin, Rock, Orpington, and Langshan are excellent sitters and mothers, but they are very heavy and apt to be clumsy with their eggs and chickens, and destroy many of them. Very large heavy hens should not be set. The Game and Chittagong are splendid sitters and mothers, but they will kill all the other chickens, and wound all the hens in the yard if not carefully watched. The common country hen, called the *Pati*, is, as a rule, the best mother of all fowls. She is not much larger than the Bantam, and is very vigilant and a grand forager. It must be borne in mind that all hens of the same breed are not equally good mothers. They differ in this as much as in laying qualities.

THE BEST BREEDS TO KEEP.—If the object of keeping fowls be only the pleasure of keeping and breeding them for home use and exhibition, the selection can be made from the following breeds :—Brahma, Cochin, Langshan, Orpington, Rock, Wyandotte, Silkie, Hamburg, and any other breed that takes the fancy. If, however, the object is to obtain a good supply of chickens for the table, as well as good birds for profitable sale, the selection should be made from the following breeds :—Wyandotte, Langshan, Orpington, Rock, Sussex, Rhode Island Red, and Australorp. If the object be to obtain only a large supply of eggs and birds for profitable sale, then the selection should be from the following :—Wyandotte, Orpington, Langshan, Rhode Island Red, Rock, Brahma, Australorp, Minorca, Leghorn and Sussex.

For all-purpose fowls, the following breeds cannot be beaten :—Langshan, Orpington, Wyandotte, Chittagong, Rock, Brahma, Rhode Island Red, Australorp, Minorca, Leghorn and Sussex.

OTHER INDIAN BREEDS.—There are breeds of fowls in India resembling the Leghorn and Hamburg in size and shape and of very fair laying qualities ; they are of various colours. Another breed obtainable in India resembles the Sussex, Rock, and Wyandotte in shape, but are smaller and of different colours. They are

very good layers. These fowls are found all over India, but especially in Bengal.

A PROFITABLE METHOD.—It costs no more to keep pure-bred birds than it costs to keep inferior ones. Pure-bred birds are much more satisfactory as layers and for the table, and sell for more money. It is always best to keep the breeds pure and not cross them, but when this cannot be done the following plan may be adopted :—Keep a stock of pure-bred fowls and some hens of other breeds, say one cock and two hens of a pure breed and two or four hens of another breed. Set the eggs of the hens of pure stock, and raise the chickens to replenish the stock, or sell. The eggs of the hens crossed by the pure-bred cock may be used for the table, or set and the chickens used for the table. This plan will insure keeping the main stock pure, and at the same time producing good eggs and fowls for the use of the household.

The pure-bred chickens will fetch good prices ; the cross-breeds will also sell well for table use.

THE BEST CROSSES.—The following breeds crossed produce good table fowls and fair layers :—

(1) Langshan, Rock, Wyandotte, Orpington, Rhode Island Red, Brahma and Minorca hens crossed with the Indian Game or Chittagong cock produce good birds for the table and fair layers.

(2) Indian Game and Chittagong hens crossed with a Langshan, Orpington, Wyandotte, Rhode Island Red or Brahma cock will produce good layers and table birds.

(3) White or Barred Rock and White Wyandotte and White Orpington make a very good cross.

(4) Black Langshan and Black Orpington and Dark Brahma are a good cross, and also a Black Langshan cock with a Black Minorca hen for egg production.

(5) Rhode Island Red and White Wyandotte or White Orpington produce a good cross.

(6) The Dorking or Sussex cock mated with Brahma or Cochin hens give good table birds.

(7) The Rock cock and the Brahma hen produce very good table birds and fair layers.

(8) The Dorking and Sussex mated with the Indian Game, the Chittagong or the Brahma produce very good table birds.

The above-mentioned are the best crosses that can be made. Promiscuous crossing will produce nothing but evil results. Cross-breeding is to be avoided as much as possible, but when two pure breeds are to be mated together, the above-mentioned plan should be strictly followed.

When one breed is crossed with another breed, cocks and hens of the same colour, or as near the same colour as possible, should be selected. Hens with long



Light Sussex.

legs should be mated to short-legged cocks, and hens with short legs should be mated to rather tall cocks. The birds should be as large and broad as possible and in perfect health.

The cross-bred cockerels should be used for the table when they are between three and four months old, and the best pullets should be kept for laying purposes. These pullets should be mated with pure-bred cocks of the same breed as their fathers. This process should be continued every year. The cross-bred hens should be killed for the table when they are between nineteen and twenty months old.

THE WAY TO IMPROVE THE COMMON COUNTRY FOWL.—The country fowl can be greatly improved by crossing the best hens with the Chittagong, Langshan, Orpington, Wyandotte, Minorca or Rhode Island Red cock. Select sixteen of the largest and best country hens you can get and let them run with two good pure-bred cocks of either of the above-mentioned breeds. Then take sixteen of the best of these cross-bred pullets and put them with two cocks of the same breed as the father of the pullets. The next year take sixteen of the best pullets of the second cross and mate them to a couple of pure-bred cocks of the same breed as the previous cocks. This process may be repeated for about five years, and there will be a wonderful transformation and improvement in the fowls of the country.

The best results are obtained from pure-bred cocks. The cross-bred cocks and cockerels should not be bred from. When cocks of the same pure breed are used in each successive cross, the results are much more satisfactory. In such a process as this the cost will be small. The price of two good cocks suited for the purpose will be quite within thirty rupees.

When selecting the pullets to breed from, only large-bodied, well-shaped, healthy birds that are also good layers should be chosen.

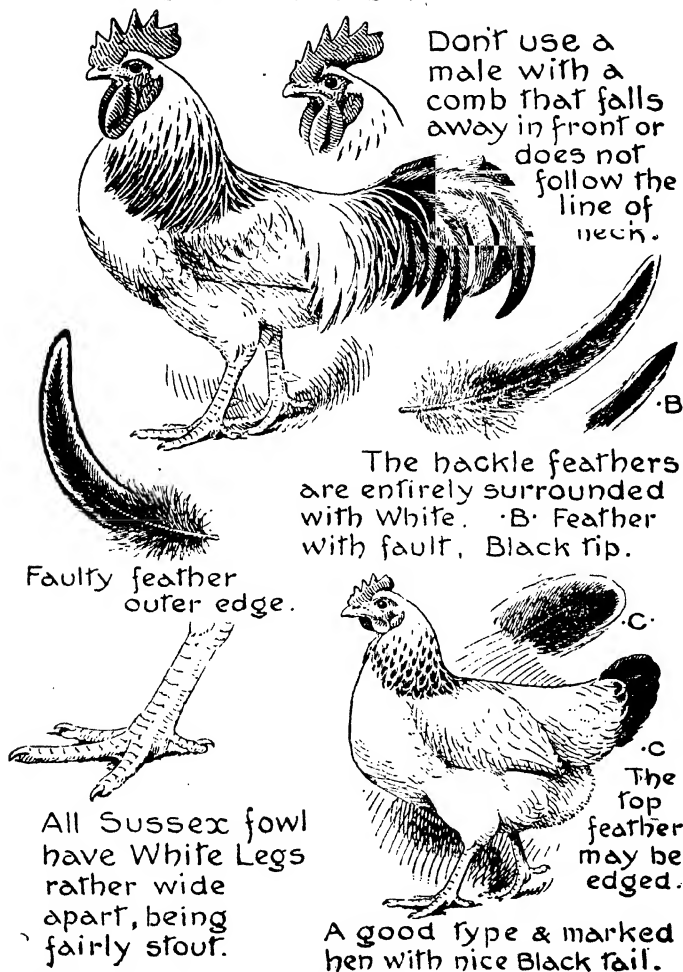
POULTRY-BREEDING IN INDIA.—Of late years there has been a great advance in poultry-breeding all over the world. England, Scotland, Ireland, America, Canada, Australia, Germany, France, Belgium, Sweden, Denmark, and South Africa have all realized the fact that poultry-raising is a very important industry and far more profitable than many other branches of agriculture. Not only have the poultry indigenous to the country been improved and their value as layers and table birds increased, but valuable birds from other countries have been imported and used to further improve the indigenous breeds, or kept pure and bred to produce the best results for laying and table purposes. The fancy side of poultry-breeding also has received a great impetus. We find the Royal Family of England foremost among poultry fanciers and exhibitors. Queen Victoria was an enthusiastic poultry fancier, and

had some of the finest birds in her Royal farms and aviaries. Some of the best families of England are successful poultry breeders and exhibitors.

In India also there has been a decided awakening in favour of poultry-breeding, and a great many people among Government officials, planters, railway employees and missionaries and also a number of Indian noblemen and gentlemen have taken a kindly interest in our feathered friends, and the prospects for the welfare of poultry in India are to-day brighter than they ever were before. Nevertheless, there is still a great deal of ignorance about the different breeds of fowls, and their economic value, and their proper breeding and care. We shall do our best to assist people to a proper knowledge of these things and help them to success.

In the first place, we will consider the value of the best breeds of fowls found in India. There are really only two or three pure breeds of fowls indigenous to India. The first is the Chittagong breed, and the other is the Asseel, and in Western India the Busra fowl. There is a large number of fowls of different sizes, shapes and colours to be found all over India. These are for the most part very much like the jungle fowl. Their size and shape vary according to the locality in which they have been raised and the care with which they have been bred; some of them have Chittagong, Asseel, Langshan, Brahma or Orpington blood infused into

POINTS OF THE LIGHT SUSSEX.



WIDDELL

Fig. 13.

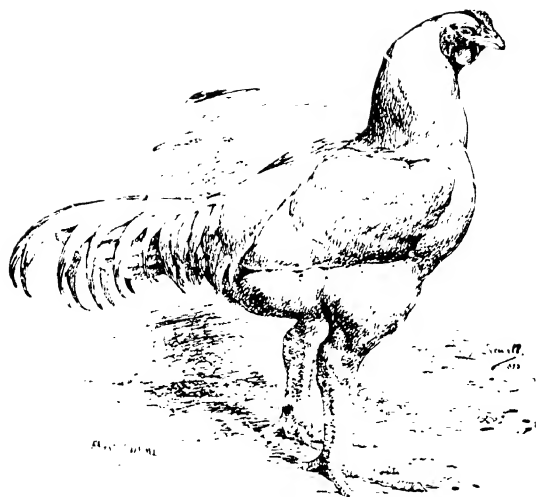
them, and are better in size and quality than the common ones.

The common Indian *moorgi*, as found in all parts of this country, is of very little value as a layer or table bird.

Those that have been produced by a cross with the Chittagong and Asseel are larger birds, and find a good market in Calcutta and other cities and towns in India. A cross between the Chittagong cock and the common hen will produce very fair table birds, and a cross between the Langshan, Rhode Island Red, Wyandotte or Orpington cock and the common hen will produce very fair layers.

A great deal can be done by Government officials, planters, railway people, and missionaries to improve the common village fowl. A great deal of time and labour is needed to attain success in this matter. In the first place, the village people must be persuaded to get rid of *all* their common cock birds and sell off all the common cockerels before the birds are three months old, and keep only the largest and best among their hens and pullets. Then, in the second place, large numbers of medium-sized Chittagong, Rhode Island Red, Wyandotte, Orpington or Langshan cockerels, between 8 and 10 months old, must be distributed among the villages. Then, again, the next year all the cross-bred cockerels and cocks and the common hens

must be removed, and only the best cross-bred pullets allowed to remain. These cross-bred pullets should be allowed to run with the pure-bred Chittagong, Rhode Island Red, Orpington, Wyandotte or Langshan cocks. The third year all the cross-bred cockerels and the hens of the first cross should be removed, and the best pullets of the second cross allowed to remain. These pullets must be allowed to run with a fresh lot of pure-bred Chittagong, Rhode Island Red, Wyandotte, Langshan or Orpington cocks. Every second year the pure-bred cocks should be changed and new ones put in their place. The cocks of one village can be put in another village, a few miles away. By working on these lines, in five or six years the characteristics of the fowls in the village will be entirely changed. They will be large, hardy, and good layers of large eggs, and will sell for more than double the money that could be got for the small common fowls. In six years these improved fowls will be very much like pure-breds in size and shape. The initial cost of working this plan is not much. It does not need money so much as work and perseverance. Fifty good Chittagong or Rhode Island Red cockerels put in one village will work a wonderful change in a few years, but it will be of very little use to put these cockerels in a village unless the common cocks and cockerels are first disposed of and all the cross-bred cockerels are removed as soon as



WHITE INDIAN GAME, AMERICAN TYPE.
Fig. 14.

they are three months old. If the common or cross-bred cocks are allowed to remain in the village, all the good work will be spoiled.

I advocate improving the village fowls by crossing with the Chittagong, Rhode Island Red, Langshan, Wyandotte, Orpington, Minorca and other good cocks. For the European, Anglo-Indian and the better class of Indian I would advise a different plan altogether. There is no need for them to waste time and energy in trying to improve the common fowl. They should keep only pure breeds, and try to perfect these pure breeds and produce the best layers and table birds. An intelligent person will succeed better with pure breeds than with cross-breeds, and he will attain his purpose, be that utility or fancy, better and quicker with the pure breeds.

THE NUMBER OF BREEDS TO KEEP.—One breed to begin with, is the best possible advice to any poultry fancier. Two pens of the same breed can be kept with advantage, as the chickens can be leg-banded to distinguish them, and unrelated birds mated up each year.

If another breed is desired later, the necessary house and run must be provided before the birds are procured. Never allow your cocks and hens to mix indiscriminately. Keep the different breeds apart at all times, or you will not be able to guarantee the breed of your chickens. It is foolish to suggest that the

different breeds of fowls will keep to themselves. *They will not.* The stronger cock of the lot will predominate, and gradually the hens will gather around him.

Every extra breed means more money, and more time and labour. If you are prepared for it, and are willing to give and do what is necessary go further and satisfy your fancy. If you tire of it, dispose of some of the birds, and keep your remaining breed or breeds pure. It is no credit to anyone to have a number of breeds jumbled together in hopeless confusion.

There are people who have succeeded with three or four varieties; they started with one, and when they had thoroughly studied the breed and improved it as far as possible, they took up another breed. They worked with the second variety as they did with the first, and succeeded with this also. Such men are bound to succeed; they have the qualities necessary for the work; they do not spare themselves in trying to gain the object they aim at. Such men can take up one breed after another until they have 10 or 15 varieties, and all will testify to the care and labour devoted to them.

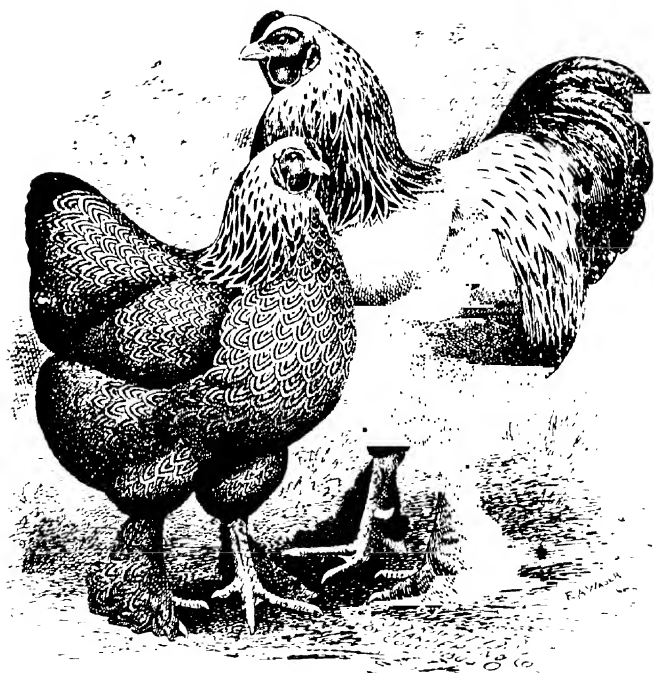
The conclusion of the whole matter is this. It is not the fowls, it is the man or woman who handles them that is the main factor in the business. Common-sense, and the power to use one's brains effectively, are two essentials in the successful keeping of poultry.

ADVANTAGES OF A SINGLE BREED.—The caption of this article is hardly comprehensive enough, for it is intended to discuss not only the advantages to be derived from limiting one's choice to a single breed, but also the advantages accruing from sticking to that breed through good report and evil report, in days of popularity and days when popularity seems irretrievably lost. This article is intended for the beginner rather than the veteran, for the one who has made but a partial study of poultry-culture.

Whatever may be the best course for an experienced poultry-breeder—whether he keeps one or many breeds—there is no doubt that for the beginner one breed is sufficient, and that if he so limits his choice, he will obtain much more satisfactory results than if he starts with several breeds. Success with a breed is conditioned upon a competent knowledge of the breed. Different breeds require different management. What will produce good results with one will often produce bad or indifferent results with another. The feeding and care must be adapted to the requirements of the breed to obtain success. A Leghorn, for example, is an active, sprightly fowl, demanding and taking a large amount of exercise. It does not lay on fat readily. Its nervous vitality demands fattening food—that is, carbonaceous or heat-producing foods, in order to keep up its activity. A Cochin, on the other hand, is of a

sluggish disposition, little disposed to hurry in its movements, taking of its own will but a moderate degree of exercise and readily developing adipose tissue. It does not require so large a proportion of heat-producing food in its daily rations as a Leghorn, but does require a larger percentage of nitrogenous food. The management and the feeding which will produce the best results must be quite different with these two breeds. Hints and suggestions can be given but experience alone can give the adequate teaching that leads to success. The beginner has everything to learn, and if he studies a single problem, he will succeed much better than if he has a number of problems to study at once.

Again, successful breeding demands that the breeder shall have a correct ideal of what he desires to produce. He must have the shape, colour, marking, habits—in short, everything that is required to make a perfect specimen of his chosen breed—well fixed in his mind. A correct ideal of any breed is made of many minute details, and the omission of any one of these means, to the extent of that omission, a distorted ideal. The ideal a breeder has, will determine all his matings and if he is so fortunate as to realize his ideal, his success will be proportioned to the correctness of that ideal. His results will never surpass his ideal ; hence the great importance of a correct ideal. And if one has but a



PAIR OF DARK BRAHMAS, AMERICAN TYPE.

FIG. 15.

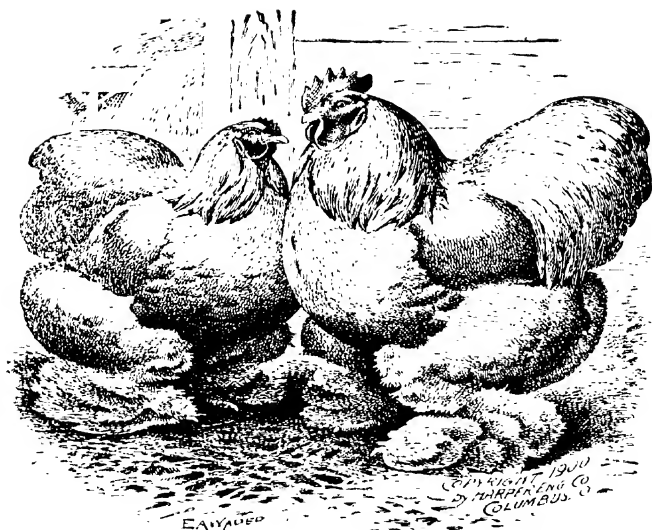
single breed, the chances of obtaining a correct ideal are much greater than if he has several breeds.

The realization of an ideal in breeding depends upon a knowledge of the breeding tendencies of the chosen breed. These tendencies relate both to colour and to shape, and they control every mating that is made. Take, for example, the Barred Plymouth Rock. A person may know just how to mate this breed to produce success, because he has studied the breed. He knows that the males have a tendency to be too light in colour and the females too dark. He knows that this is a natural tendency from the history of the breed, and that, though it is now nearly 40 years since breeders have sought to bring the two sexes to a uniform shade, the tendency fixed by the origin of the breed has not been fully overcome. He knows, therefore, that to secure the correct colour he must mate his birds to overcome this tendency, and to do it he must make special matings. Suppose he is a beginner, and instead of having one breed he has six or eight, how long, think you, will it be before he hits upon the exact matings that will bring uniform success? The man who has succeeded in poultry-breeding is he who took but a single breed to start with and later added a second, after he had mastered the first one.

Now, all these things—the study of the proper management and feeding, the learning of the habits and

characteristics, the formation of a correct ideal, and the understanding, through a knowledge of the breeding tendencies, of how to realize that ideal—give ample scope for the exercise of the talents of any beginner. He certainly does not need to have his mind diverted from the one chosen breed and have his studies multiplied by five or ten, in order to give sufficient employment to his faculties.

There is another advantage in limiting one's choice to a single breed that is seldom mentioned, but really deserves careful consideration. If one has only a single breed, when the time comes to introduce fresh blood, he need buy but one or two male birds—if he introduces it from the male side. If he has five breeds, he will need to purchase five or ten birds. The majority of breeders, whether they have one or more breeds, have but a limited amount of money that they feel willing to set apart for this purpose. Say for illustration, that this sum is Rs. 300. The breeder who has limited his choice to a single breed can buy three birds at Rs. 100 each and thus insure the purchase of not only well-bred but of superbly excellent specimens. The one who has five breeds will have 15 birds to purchase, and he can spend but Rs. 20 on each specimen—a sum sufficient to purchase fairly good birds, but not birds of the character that Rs. 100 will buy. All the next season the flocks will show the effects of these purchases. The



PAIR OF BUFF COCHINS, ENGLISH TYPE.

Fig. 16.

one who can afford to spend five times as much for his males, will, other things being equal, improve the quality of his flocks much more rapidly than could the other man.

There is a decided advantage from a business point of view in being known as a breeder of one breed. In other words, after making the selection of a breed, it pays to stick to it. As a poultry writer, one needs to know many breeds: as an experimenter and producer of new breeds, it is necessary for one to handle nearly every kind: but as a breeder who expects to get pleasure or make money out of his fowls, he needs to cling to some one breed.

In the first place, it gives the people confidence in his stock. They say he breeds only one kind; there will be no chance matings among his fowls; he will know what he is about; he can give the buyer the best of the kind. And, singularly enough, people will also argue that as the breeder is a sensible man and has selected one breed, that breed must be the best breed to be had. If he issues a circular, the public's attention is not distracted by rival claims of different breeds, so that it does not know what to buy, but it is focussed on a single breed and is convinced that that is the breed to buy, and so the orders flow in in a golden stream.

Again, the breeder who has a single breed, and sticks to it, gets the full advantage of his exhibiting

and advertising. Each year's prizes are cumulative. People remember that this man won on Buff Orpingtons or White Orpingtons at the best shows. His advertising becomes cumulative also, and his name becomes, through the law of association of ideals, inseparably connected with the chosen breed. If one wishes to purchase a given breed, he will at once think of the breeder who has stuck to it for so many years.

It is a strange thing, but it is nevertheless true, that no man's name becomes equally associated with even two breeds ; it stands for one, and the second is recalled only by an effort of memory.

If he should cease advertising, or if he should give up breeding that one breed, five years from now, there would be people ordering that breed from him if he were still alive.

One breed is enough for the beginner ; if the veteran adds several breeds to the one of his choice, still his chief reputation will rest upon a single breed ; and to obtain the best financial results, beginner or veteran needs to persist in the choice he has made, for in no other way can he secure the cumulative advantages of his winnings and his advertising.

POULTRY FOR THE TABLE.—It is gradually dawning upon the poultry-keeping community in India that the old system, if system it can be called, is as useless as it is stupid, and that unless birds are kept upon a

rational principle, profit is practically impossible. If we assume that an average laying hen costs two annas a week for food, or Rs. 6 per annum, it follows that, putting out of sight for the moment the question of labour and other expenses which follow where hens are kept in large numbers, profit is absolutely certain unless there is some very gross ignorance in the management. If, however, we add to the cost of the food the sum spent for labour, the interest of the money invested in the birds and their houses, the rent of the land and the losses which occur from deaths, even then there should be a substantial profit gauged from the point of view of the sum of money invested. Poultry-keeping as an industry is perhaps not able to maintain an individual European or a European family in India. It should be combined with some other form of work, and it can be so combined, but there are a large number of Indians and poor Anglo-Indians who could easily earn from 50 to 200 rupees a month, from poultry-breeding, and comfortably maintain a family.

Poultry-keeping in the hands of the average individual should, in this way, return an ample profit. It is the object of this article to show upon what basis such profit can be most surely obtained. It has nothing to do with what is termed "show poultry." Pure breeds are intended and from among those breeds you should select the most useful of their kind.

No man in his senses would keep the Dorking for the production of eggs, or the Leghorn for the production of meat. Let us first endeavour to classify the chief table and egg-producing breeds.

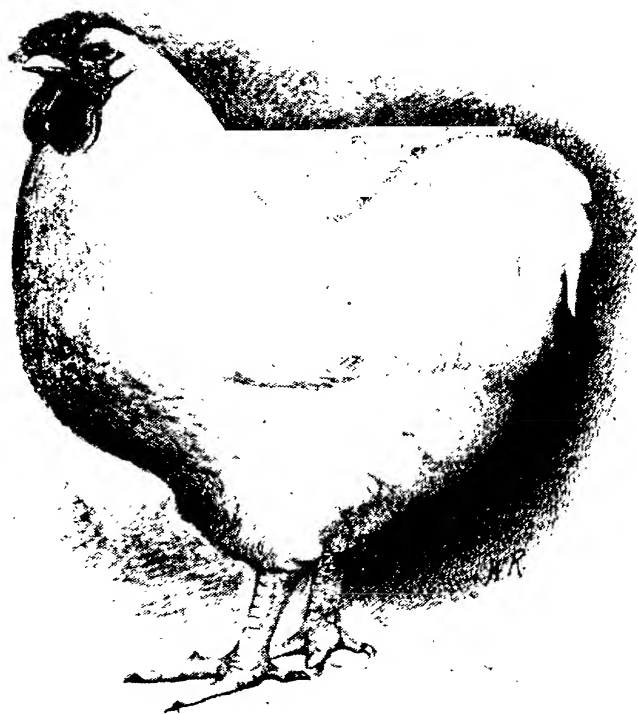
Table Breeds.—Indian Game, Chittagong, Dorking, Sussex, Langshan, Wyandotte, Rock, Orpington, Brahma, Australorp and Rhode Island Red, etc.

Egg Producers.—Wyandotte, Rhode Island Red, Orpington, Langshan, Rock, Brahma, Chittagong, Cochin, Indian Game, and Australorp. Among the smaller breeds—Leghorn, Minorca, Ancona.

Table Fowls.—Supposing the poultry breeder's desire is to produce chickens for the table, his first object should be to secure birds of the right type and quality; he must next learn how to feed them, and, lastly, how to breed them.

Amongst the finest birds for the table are the Indian Game and the Chittagong. The Sussex, the Dorking, the Wyandotte, Langshans and the Orpington in their pure state produce as fine table birds as can be found anywhere in the world. Now, it is possible, by breeding and feeding carefully, to obtain fowls which, in the best season of the year, will be worth from Re. 1 to Rs. 3 each for table purposes.

EGG PRODUCTION.—We now pass to egg production. A hen consumes sufficient food to enable her to produce a larger number of eggs than is her average.



WHITE WYANDOTTE COCK.
Fig. 17.

Instead of sixty eggs, which is probably in excess of the average produced per hen in this country, hens can be induced to lay 120 to 250 eggs by the process of selection and by proper feeding. There is no doubt that even this figure will be exceeded, as breeders pay more attention to selecting their breeding stock from the best layers only, and as they grasp still more clearly the principle upon which the system of feeding is based. If, however, the average poultry-keeper could obtain 200 eggs per hen per annum, he would do very well indeed, but this is not usual, simply because people will not devote that study to the subject which it really demands.

When we say that certain breeds are the best laying breeds, we do not forget that the exhibition system in England and America does a great deal to destroy their laying power, and a person buying hens for economic purposes should be guarded against making any selection from the poultry-yards of individuals who are constantly exhibiting their birds.

The Langshan, the Orpington, the White Wyandotte, the Rhode Island Red, the Brahma, the Rock, and the Sussex are the best fowls to produce large brown eggs.

The Chittagong lays smaller eggs.

Leghorns, Minorcas and Campines lay large white-shelled eggs.

CHAPTER VI.

THE DIFFERENT BREEDS OF FOWLS.

THERE are many breeds and varieties of fowls to be found in Europe, America, and Asia. Let us study for a moment such breeds as are profitable to keep.

1. BRAHMA.—The Brahma is most prominent as a family fowl. It is valued for its great size and hardiness, and for its being a good layer of rather large-sized and rich eggs. The flesh of a four to six month old bird is very good; that of older birds is rather coarse.

Brahmas are exceedingly quiet and tame, and can easily be kept in a small run with a four-feet high fence. The hens are good sitters and mothers. The chickens are hardy and grow fast, being ready for the table in from four to six months. Some birds of this breed grow to immense size and weight; cocks should weigh from 10 to 12 lbs., and hens from 7 to 10 lbs.

They are very handsome birds, majestic in appearance, having heavily-feathered legs, though less so than Cochins.

There are two varieties of Brahmas—Light and Dark. The outward appearance of both is similar in

everything but colour of feathers. In America they have a third variety—the Buff. The Buff Brahma is in fact the Buff Langshan with a pea-comb. The Buffs are very superior birds, both for laying and table.

The Brahma should have a small, neat head, small pea-comb, and deep, massive body. The back should be of medium length and broad; breast broad and forward; and the saddle should rise to the tail. The tail should be rather upright and spread out like a fan, but the sickle should be an inch or two longer than the tail. The beak should be strong, curved and yellow or dark. The comb—the smaller the better—should consist of three serrated ridges, the central ridge being the largest, and unite at the pike and curve backwards. The ear-lobes should be bright red and round; the wattles bright red, long, and pendant. The neck should be curved, giving grace to carriage. The hackle should be flowing and abundant, increasing in bulk from the point nearest the head, and fall over the back. The wings should be small and the points well tucked away under the saddle feathers of the cock, and under the fluff of the hen. The feathers of the back and thigh should be abundant in the hen. The leg should be rather short and of light or dark yellow colour, feathered to the tip of the middle toe. The legs should be strong and well formed. The Brahma is square

rather than lumpy, and of sprightly and active habits, much more so than the Cochin.

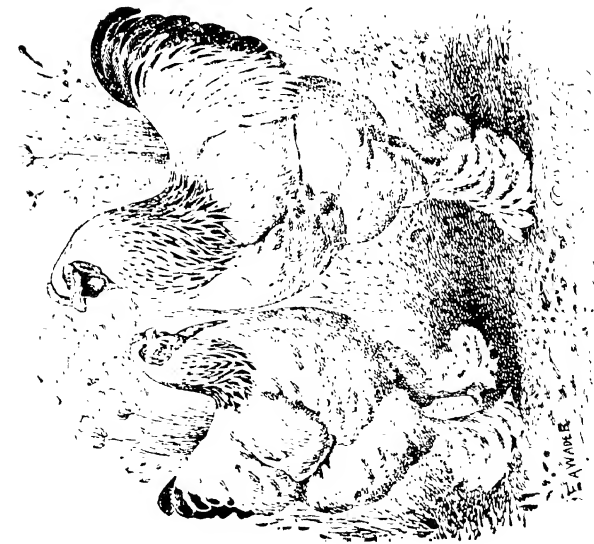
In India birds heavily feathered on the legs are at a disadvantage. They suffer much from wet and damp during the rains and from heavy dews. Clean-legged birds are to be preferred in India.

The tendency of all birds bred in the plains of India is to have less feather and fluff.

Brahma chickens are hardy and grow rapidly. If kept in a run and fed properly and protected from the sun and rain, they do very well.

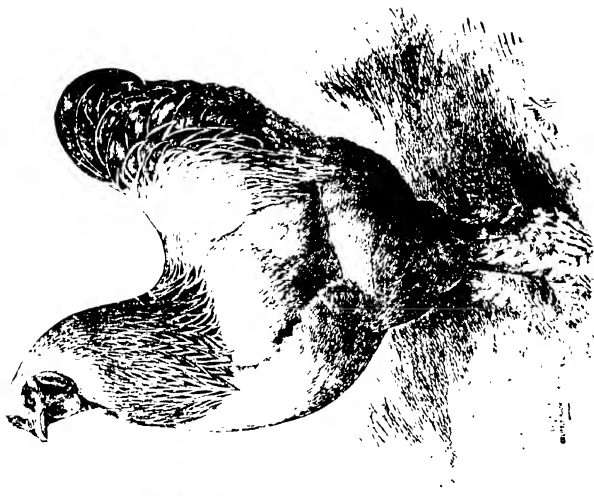
The plumage of the Light Brahma should be mainly white, the correct shade being pure white. The flight feathers, the neck-hackle and the saddle should be black, with an edging of white to each feather. Black feathers should be interspersed in the legs, while the tail and tail coverts should be principally black, some feathers being striped with white. The fluff should not be dark. There are specimens of pure white Brahmas, but those with black markings are preferred and are considered the best at exhibitions. The pure white birds are exceptionally handsome.

In Dark Brahmas the predominating colour should be black. The head, in both the cock and hen, should be white and the neck-hackle white, striped with black. The primary feathers in the wing should be black bordered with white. The breast and tail of the



PAIR OF LIGHT BRAHMAS, ENGLISH TYPE.

Fig. 18.



LIGHT BRAHMA COCK, AMERICAN TYPE.

Fig. 19.

cock should be black, the back white, and other parts of the body chiefly black, with a little white mingled among it. In the hen the ground-colour of the whole plumage, except the head and neck, should be dark grey, and each feather pencilled with metallic black. The fluff should be black. Some hens are of a lighter grey with dark grey pencilling. The lustrous bar on the wing of the cock should be green-black.

Light Brahmas are considered better layers than the Dark ones, but Dark Brahmas attain to a greater size than Light ones. In judging Brahmas, colour, size, shape, feathers, and conditions must be taken into consideration. In breeding Brahmas, the first and most important point is the selection of the birds to be bred from. Both the males and females should be as perfect as possible, and should be descended for as many generations as possible from only first-class stock. In order to acquire a correct knowledge of the standard of perfection, in any breed the reader should study "The Illustrated Book of Poultry," by L. Wright.

The Brahma is supposed to have originated in India, but now it is largely bred in Europe and America. The best birds are imported from England and America. The American Brahmas are better layers and table birds than those bred in England. English breeders have gone in too much for fancy points and heavy feathering, and sacrificed useful qualities. Probably

the Brahma originated from a cross between the Cochin and the Malay fowl. It is now an established breed and has all the good qualities of both the Cochin and Malay.

Good stock birds can be had from forty to seventy rupees per trio—a cock and two hens. Imported birds cost more. Some exhibition specimens have been sold for as much as £40 and £50 each. This applies to most breeds.

2. COCHIN.—The Cochin somewhat resembles the Brahma in shape and general appearance, but is rounder and more fluffy. The hens are fairly good layers, and good sitters and mothers, but are very clumsy and apt to break their eggs and crush their chickens. They are very quiet and tame, and can be kept in a small run enclosed with a three-feet fence. They are not so sprightly and active as the Brahmas. They are great favourites with many people, and are essentially the fanciers' fowl.

The chickens are hardy and easily reared, but should be kept in moderate-sized runs, and protected from the sun and rain. They do best when kept separate from other chickens. Cochin chickens need extra animal food and a larger quantity of food than chickens of any other breed.

Cochins are not very good table fowls; their flesh is rather coarse after they are six months old; but their eggs are very rich, and usually of a fair size.

They grow to a large size. The cocks should weigh from 8 to 11 lbs., and the hens from 7 to 9 lbs.

The comb of both the cock and hen should be single, small, and erect; the head small and neat; the earlobes red; the eyes red, dark or yellow; the neck rather short; and the hackle flowing widely over a short and broad back, which should rise at once into a broad saddle in the cock and an ample cushion in the hen; the breast should be broad, deep, and full; the tail of the cock and hen should be as small, low and full as possible, with very little quill in it; the wings should be small and deeply tucked in between the cushion or saddle above and the fluff below; the legs should be short, thick, yellow in colour, and heavily feathered. Some birds have very few feathers on the feet. In England the Cochin has been bred to great perfection in colour and shape, but their good laying and table qualities have been sacrificed for exhibition points.

There are five leading varieties of Cochins: the Buff, Partridge, Cuckoo, White, and Black. The Buff and the White are the handsomest.

Buff.—The plumage of the Buffs may vary in shade from bright lemon to deep cinnamon. The hen should be the same shade all over; the hackle, saddle feathers and wing bar of the cock may be a little darker than the rest of the body; a very small amount of black may be allowed in the tail and flight feathers, but none

on the hackle or saddle; neither should any white be seen in the tail, wing or other part of the body.

Partridge.—The breast, underpart of the body, thighs and tail of the cock should be black; his hackle and saddle should be golden, with a black stripe down the centre of each feather; he should have a rich red back and bar on the wings. The plumage of the hen should be light-brown, and the feathers closely and uniformly pencilled a darker brown; her hackle should be deep yellow.

Cuckoo.—The plumage of the Cuckoo is a light bluish grey, barred across with lines of darker shade, like the Barred Rock.

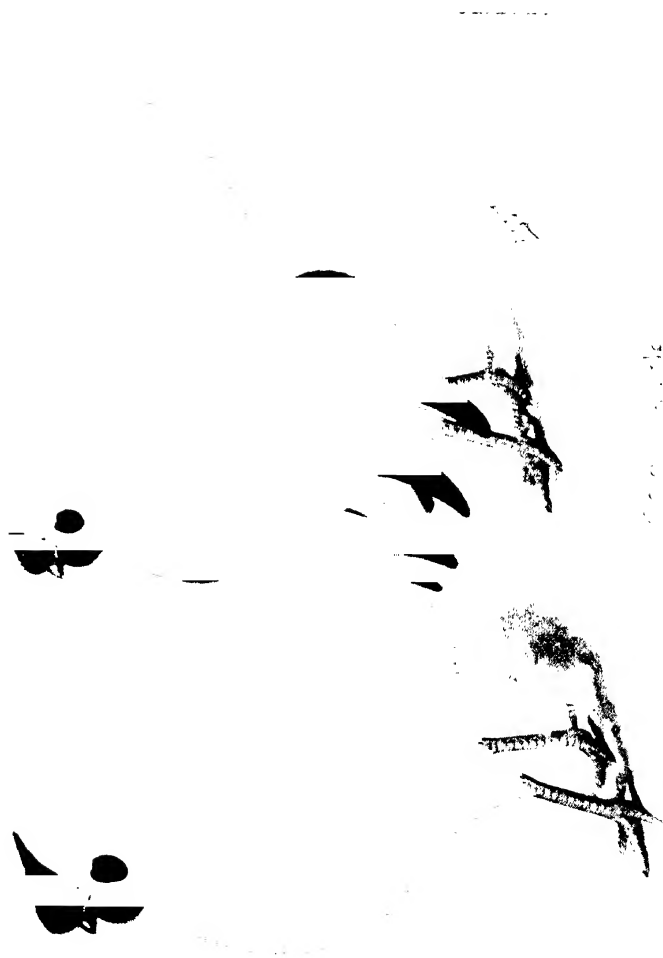
White.—The plumage of the White Cochins must be pure glossy white all over, with no feather of another colour.

Black.—Black Cochins must be of a glossy greenish-black all over.

*Silkie*s.—There is a breed of silky Cochins. Many years ago some very fine birds of this variety were imported by a gentleman in Calcutta. They were called “Cochin-China fowls” and were large handsome birds, buff and white in colour.

The Cochins are a China bird, but is largely bred in Europe and America.

3. *LANGSHAN*.—The Langshan is a very handsome and useful bird. It is one of the best all-round fowls to



be found. The hen is a good layer, and splendid sitter and mother. A good strain of this breed cannot be excelled by any other breed as layers. These birds are very tame, but have longer wings than either the Brahma or Cochin, and need a fence five feet high to keep them in. They need large runs and plenty of exercise.

There are four varieties of this breed—the Black, the Buff, the White, and the Blue. The Black is the pure original breed. The White is a sport from the Black. The Buff and Blue are manufactured varieties. The plumage of the Black variety should be black throughout with a green or purple sheen. A dull black is objectionable. The plumage of the Buff should be like that of the Buff Cochin; that of the White pure white throughout, and that of the Blue should be slate blue.

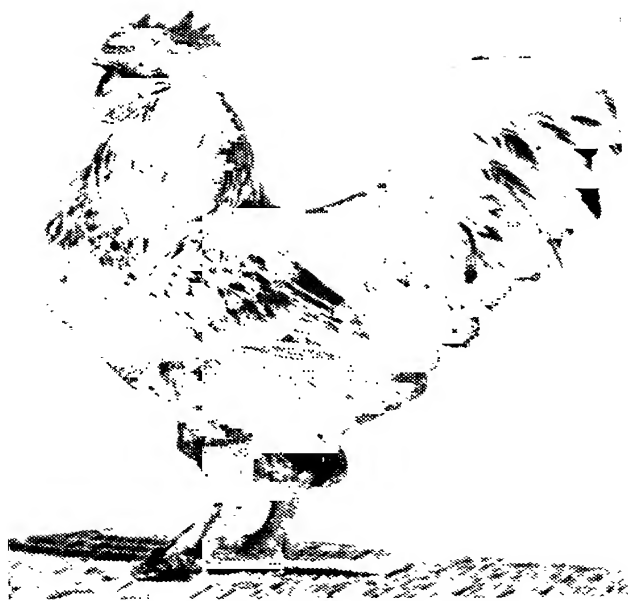
The Langshan carries abundance of flesh of good quality and flavour, and is unrivalled as a layer of rich dark-shelled eggs. The cock should have a single and medium-sized comb—the hen a single and rather small comb, though rose combs and tufts on the head are occasionally seen in both cocks and hens; the comb of both the cock and hen should be erect; the breast should be broad and full and prominent; the carriage upright; neck arched; legs of moderate length, dark coloured, and scantily feathered, the tail full and carried

rather high; they should not have much fluff; the skin should be white. The cock should weigh from 9 to 11 lbs., and the hen from 7 to 9 lbs.

These birds will thrive well in India, and are very hardy if kept in dry, shady and properly ventilated places, and given plenty of liberty, but they will not stand wet and damp or exposure to the sun, and will not thrive in close confinement.

The chickens are hardy as regards all conditions except damp, sharp cold winds, and close confinement. They grow fast, but do not fledge very quickly. They cannot stand pampering; they must be allowed to run with their mother, and scratch for some of their food. Langshan chickens should be kept by themselves and not mixed up with those of other breeds. They need large runs and a great deal of liberty, and some animal food.

The chickens of the black variety, when first hatched, are very peculiar. They are covered with black down, and the head, face, and breast are a mixture of black, white, and different shades of canary colour. These shades are not distributed according to rule—in some the light predominates, in others the black. In some of both sexes the white feathers are retained until they are four or six months old, when the white is replaced by perfectly glossy black feathers. Some have pinkish and some have dark legs, but the bottoms



BROAD LANGSHAN COCKEREL.
FIG. 20.

of the feet are nearly always pinkish white. They should have dark or hazel eyes.

The Langshan is a China bird, but is now bred to perfection in England and America.

4. **Rock.**—Rocks are very handsome and useful birds. They have plenty of good-flavoured flesh, and are good layers. They are capital sitters and mothers, and are quiet and tame. They are hardy, and can be kept within a five-feet high fence in rather large runs. The chickens are hardy and mature early. These birds are sometimes bred to a great size, but, as a rule, cocks should weigh from 8 to 11 lbs., and hens from 7 to 9 lbs.

The comb should be single and small, but there are some with rose combs; the beak yellow; the neck curved and back broad; the breast very broad; the wings well tucked up; the tail short and full; the legs rather short, stout, clean, and yellow; the birds should be compact and square in shape.

There are four varieties of this breed—the Barred or Cuckoo, Buff, Black, and White; but the Barred and White are considered the best. American breeders are evolving some new varieties of this breed—the difference being in colour only. All these varieties are alike in everything but the colour of their plumage. The plumage of the Barred should be light-grey or steel-grey, and each feather striped with bars of bluish

black ; there should be no black, white, red or yellow feather in the plumage. The White ones should be pure white with yellow beaks and legs. The White ones are very large and handsome birds and good layers.

It is very difficult to breed the Barred to perfection in colour. Some will come very light, almost white ; others will come dark, almost black. The White and Buff are bred more easily. The only way to prevent the Barred Rocks from coming too light or too dark is to mate the breeding stock properly. If the hens are too light in colour, a cock should be selected that is rather dark, or if the hens be too dark, a light cock should be selected.

The Rock is an American breed, produced by crossing their Dominique with the Black Langshan and the Malay or Chittagong. Some of the birds still come with a few feathers on the legs, and some with rose or pea-combs.

5. WYANDOTTE.—The Wyandotte is a good breed of fowls. They are good table birds and layers. They are very good sitters and mothers, and are very hardy when mature. The average weight of the cock is between 7 and 9 lbs., and that of the hen between 5 and 7 lbs.

The comb must be rose, with a good spike, and closely fitting to the head ; the beak should be yellow ;

the breast deep and broad ; the legs rather short, of a bright yellow colour, and free from feathers. In shape it resembles the Rock.

There are now five principal varieties of Wyandottes : the Silver-laced, the Gold-laced, the White, the Columbian, and the Buff. Other varieties are the Buff-laced, the Partridge, the Black, the Cuckoo, the Spangled and the Blue. The White ones are the prettiest and the best all-round birds. The other varieties also are very handsome birds. The White Wyandotte is an excellent layer of large tinted eggs. In laying contests they have often beaten the Leghorn. Some of the Wyandottes still come with single combs and feathers on the legs. Careful breeding will remedy these defects in a few years.

The plumage of the Silver-laced should be black striped or laced with silvery-white ; the tail black and full ; the outer edge of the wing primaries white.

The Columbian should be like the Light Brahma in colour. It is a large bird and a good layer.

The Black, Buff, and White should be self-coloured. The Gold-laced should be black laced with bright yellow. The Partridge should be coloured like the Partridge Cochin.

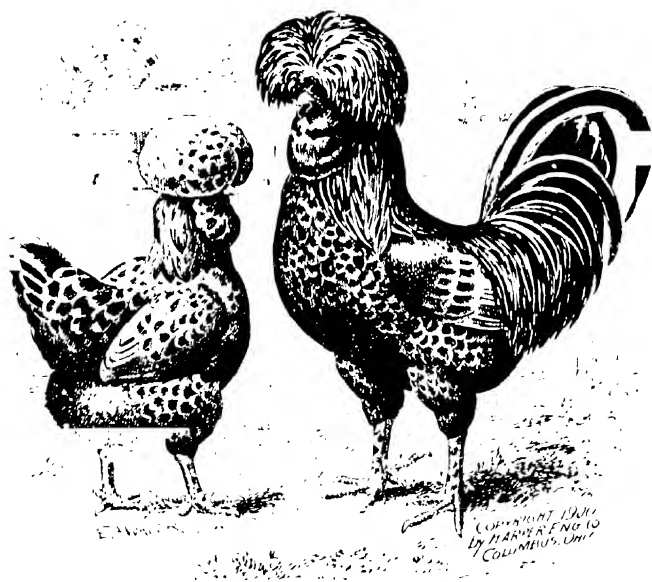
The Wyandotte is an American breed, made from a cross between the Brahma, Silver-laced Hamburg, and the Chittagong or Indian Game. For the first

month or so the chickens need extra care, as they are rather delicate. They cannot stand wet, damp, or strong winds and should be protected from the hot sun. They do better when they are given to a special hen to bring up and are not mixed with other chickens.

6. HOUDAN.—The Houdans are useful birds. They have plenty of good flesh on them, and are capital layers, but are not as good all-round birds as the Wyandotte, Langshan, or Orpington. They are fairly hardy on dry soil and moderate climate, but will not thrive in Bengal, Assam, or where the rainfall is heavy. They are a non-sitting breed. The cocks should weigh from 5 to 7 lbs., and the hens from 4 to 5 lbs.

The comb must be leaf-shaped, and above it a large crest; the crest must be large, arched, full in the centre and falling over the sides; the beard must be very full, and the wattles fairly long and thin; the face wattle red; the nostrils arched; the beak black; the hackle full; the breast broad and full; back straight; the wings carried well up; the tail full, high and nearly erect; sickle black and white; the legs thin and nearly white; the thigh short and thick.

They always have a distinctly defined fifth toe. Their plumage should be black and white. The black must be of an olive-green tint and the white evenly spangled all over the body. The Houdan is a French breed.



PAIR OF HOUDANS.

Fig. 21.

7. MALAY OR CHITTAGONG.—These birds are called Malay, because they are natives of the Malay Peninsula, and Chittagong, because they are largely bred in Chittagong. These fowls are also called “Deang fowls” as the best specimens are bred in a place in Chittagong called “Deang.” They can also be got in Bodalpara and Anwara, in Chittagong.

They are very large birds; the cocks sometimes measure two feet six inches from beak to toe, and weigh from 8 to 10 lbs.; the hens weigh from 6 to 9 lbs.

The flesh of the Chittagong fowl is excellent. The hens lay well, but are not very good mothers on account of their quarrelsome nature. If each hen is kept alone with her chickens, she will do splendidly and protect them from all intruders. Adult birds are very hardy, but do not bear confinement well. They do best when given a free range. They are very quarrelsome, and when kept in confinement need a high fence to keep them in. The chickens for the first month are not very hardy, and need much care; but they become very strong when they grow to be about three months old. The chickens will not stand confinement and pampering. If given their liberty from the second or third day after they are hatched, fed judiciously, and kept out of damp and wet, they will do very well. They need some extra animal food. The best time to raise

Chittagong chickens is February and March, and from July to September, when there is plenty of green grass and animal food about the place. Chittagongs grow rapidly and make excellent birds for the table. The chickens should be reared by themselves, and not mixed with chickens of other breeds.

The Chittagong should have a small pea-comb, like a soft lump covered with small warts ; the head and beak should be long ; the beak yellow ; the wattles very small and red, in the hen hardly visible ; the ear-lobes small, red, sometimes with a little white ; the eyes white or light yellow ; eyebrows prominent and overhanging the eyes, making the head look very broad ; the neck long ; the breast broad and deep ; the carriage very upright ; broad shoulders ; slightly narrow loins ; the wings carried high and projecting at the shoulders ; the back sloping gradually to the tail ; the tail small and full, in the cock it should droop ; the legs yellow, straight, long and strong, without feathers ; the plumage very close, firm, short, and glossy ; the feathers narrow.

There is no fixed standard of colour for this breed. Good birds will be found in all colours. The poorer people of India have no proper idea of scientific breeding. The Buff, White, Black, Dark-brown, and Grey are the recognised varieties, but the Buff or Light Yellow is considered the best. It will take years of most careful



WHITE HYDERABAD GAME COCK.

breeding to get these birds to breed true to one particular colour.

Bufs.—The cocks should be buff or golden, with bright yellow hackle and saddle; there should be no black or white feather about the neck, hackle, or back; the tail and wing primaries should be ash-grey or white tipped with green, the sickle ash-grey or black with yellow lacing, the coverts ash-grey or black with yellow border. The hen should be buff or light yellow; the back of the neck, hackle and smaller feathers in the tail may have some ash-grey feathers; the tail and wing primaries should be ash-grey or white, a little black in the tail and primaries is allowable.

The White ones should be pure white all over with yellow legs and beak. The Greys should be in colour like the Light or Dark Brahma.

Ordinary birds sell for from one rupee eight annas to three rupees each. Good stock birds will sell for from ten to fifteen rupees per trio—one cock and two hens.

8. ASEEL OR INDIAN GAME.—Aseel means real, true: and the Aseel fowl is supposed to be the real pure Game. It is one of the best table birds; its flesh is peculiarly well-flavoured, and there is plenty of it.

Aseels are not very good layers, but they lay large and rich eggs. They are good sitters and good mothers. They require a certain amount of liberty, and will not thrive well in confinement. They are intensely

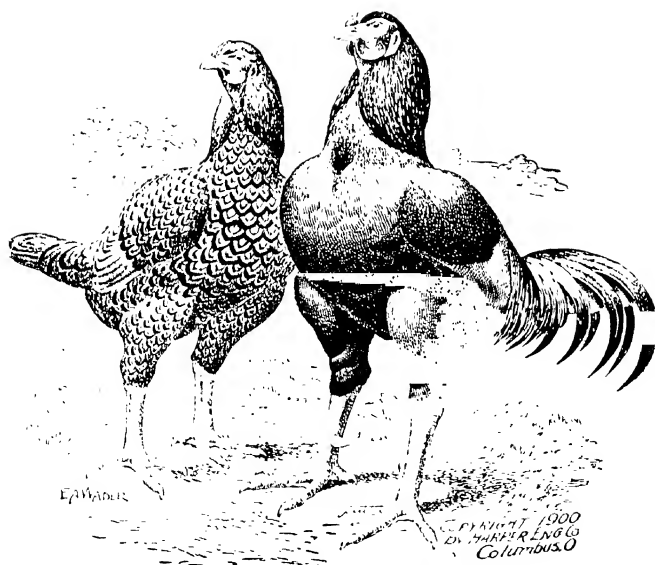
pugnacious, and on this account, are hard to keep. The chickens are rather delicate, and need great care and plenty of animal food and perfect liberty. They should not be kept with chickens of other breeds.

In-breeding has greatly injured this breed in both size, constitution and laying qualities. The birds one sees in the bazaars in Calcutta, Allahabad, Lucknow and other Indian cities, though called Aseel, are nothing but cross-breeds between the real Indian Game and the common country fowl. This cross is resorted to in order to lighten the weight of the fighting cocks and make them more active. The real Game fowl is a large noble-looking bird. The best specimens are now found in Hyderabad and Mysore, where they are bred to a great size.

The cocks should weigh from 9 to 10 lbs., and the hens from 7 to 8 lbs.

The comb must be small and pea-shaped; face long and somewhat slender; heavy eyebrows; thick and long neck; hard and close-feathered; very broad breast; very upright carriage; small and drooping tail. In appearance they somewhat resemble the Chittagong, but have shorter legs and are more round and compact.

The colour is black, white, duck-wing, black and red, and mottled. The pure white are the handsomest birds.



PAIR OF BLACK-RED INDIAN GAME.

Fig. 23.

Some good specimens are to be found in Chittagong near and around Cox's Bazaar.

No bird can equal the pure Indian Game for putting size and stamina into other breeds.

These birds are called the *Kullam* in Bombay and some parts of India. The Indian Game is bred to perfection in England, America and Australia.

Ordinary birds will sell in the Bazaars for from two to five rupees each. Good stock birds sell for from thirty to one hundred rupees per trio—one cock and two hens. Some choice specimens have been sold for 500 rupees each.

9. GHAGUS.—The Ghagus is a peculiar Indian breed. In shape and appearance they are very much like the Faverolle, but without feathers on the legs. They are good table fowls, and fair layers. They are hardy, but will not bear confinement. They are good sitters and mothers.

The comb is either single or pea and small; the wattles and ear-lobes small; neck thick; throat loose and baggy; some have whiskers and beards; the body large and rather square; the legs rather long, smoky-yellow or greenish; both the cocks and hens grow very large. They are of various colours—red, bay, brown, black and grey. I believe this breed was produced from a cross between the Malay or the Indian Game and the Brahma or Langshan and the Houdan. The

Ghagus is becoming very scarce, and is not often seen nowadays. The best specimens can be procured from the Gipsy Nomads who wander over India, especially in the Deccan, Mysore and Sind.

Good birds can be had, when obtainable, for from six to ten rupees per trio—a cock and two hens.

10. ORPINGTON.—The Orpington is one of the best breeds produced in England. In 1886 that great poultry-man, Mr. William Cook, of Orpington, England, originated them. The Orpington is a most useful bird—a good table bird and an excellent layer—two qualities that are very seldom found in any one breed.

There are now three distinct popular varieties of this breed—the Black, the Buff, and the White. The Black variety has been produced by crossing together the Barred Rock, the Black Clean-legged Langshan, and the Black Minorca. It is very much like the Langshan in shape, size and laying and table qualities, but is without feathers on the legs, somewhat rounder in make and shorter in leg. The colour should be exactly that of the Black Langshan, i.e., pure black with a glossy green or purple sheen.

The Buff Orpington has been produced by crossing the Buff Cochins, the Golden Hamburg and the coloured Dorking. There is also now Malay blood in it. The colour of the Buffs should be that of the Buff Cochins.

In size, shape and useful qualities the Buffs are equal to the Blacks. The Buffs are considered better layers.

The Whites have been produced by crossing the White Rock, White Dorking, White Leghorn, and White Langshan or the White Surrey fowl.

There are also Blue, Speckled, and Red Orpingtons.

The White, Black and Buff are the most popular, and fetch the highest prices in England, America and Australia.

Orpingtons should have no feathers on the legs. They should have red faces and ear-lobes; broad breasts, long breast-bones; white flesh; short legs, in the Buffs and Whites white or pink in colour; tail carried well back and straight. Among all three varieties you will find single and rose combs. The comb should be of small size and evenly serrated and straight.

The Orpington is very much like the Rock or Langshan, and looks like a clean-legged Langshan with a tail between that of a Cochin and Langshan, and short in legs. Cocks should weigh from 9 to 11 lbs., and hens from 7 to 9 lbs.

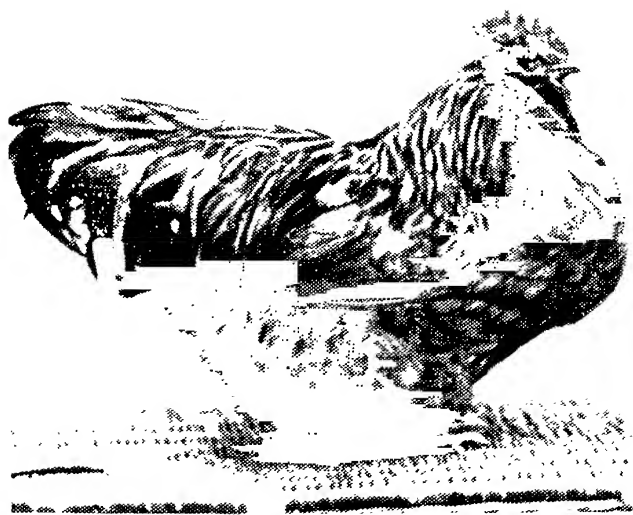
The chickens are hardy and grow fast, but need the same treatment as Langshan chickens.

Some excellent Orpingtons have been imported from Australia by breeders in India.

There is really very little difference between the Buff Orpington and the Buff Rock, or the White

Orpington and the White Rock. The chief difference is in the colour of the legs and skin. The Orpingtons have white skins and legs, and the Rocks have yellow, but the Orpingtons are shorter in legs and looser in feather than the Rocks.

11. SILKIE.—These curious and beautiful little fowls are remarkable for the colour of the skin and silky hair-like nature of the plumage. They are of Chinese origin. They are not profitable poultry in the ordinary sense, but make capital sitters for pheasant or partridge eggs and are good mothers. The head and beak must be small. Face dark purple. Comb—a queer lumpy round rose comb, of dark purplish colour. Crest, full and round, not cockatoo shape. Wattles long, purplish. Ear-lobes purplish, tinged white. Body square, covered with silky fluffy feathers. Wings carried low. Legs shortish and bluish-black in colour ; some have five toes, some only four. The fifth toe is a deformity that should be bred out. They are good eating in spite of the purple colour of the skin. Of all species of Bantams, the Silkie is the best. They are very hardy and easily reared. They need a great deal of liberty, and their chickens thrive best when allowed to run with their mother in a large yard or garden. Some of these birds have feathers on the legs. They should be either clean-legged or very scantily feathered, but never with vulture hocks.



EXHIBITION BLACK ORPINGTON COCK.

FIG. 24.

12. DORKING.—This is an old English breed. The general characteristics of the Dorking should be a large, deep square body, the breast-bone being long and prominent, white skin, white legs and feet, five toes, the fifth being clearly separated from the fourth and turning upwards, and white toe-nails. The fifth toe is a deformity and a disfigurement which should be bred out. The head large, wattles large and pendulous in the cock, not so large in the hen, and rounded. Eye full and bright; comb single or rose in coloured Dorkings; single in silver-greys (though fine rose silver-greys have been shown); rose in white or cuckoo.

The single comb should be upright in the cock; in the hen it should fall on one side of the head. In the cock it should be thick, firm on the head, evenly serrated, free from side sprigs, semi-circular in outline seen from the side, and of fine texture. Thighs stout and covered by the plumage. Legs short and stout, and spurs carried inside. (Dorking hens and even pullets frequently have spurs of considerable size.) The general appearance should be massive and dignified.

Dorkings are inferior layers, but they lay large eggs, and are very good table birds. The chickens are very delicate and difficult to rear. They are very scarce in India.

13. MINORCA.—The Minorcas are in many places known by the name of "Red-faced Spanish," and are

the nearest, in shape and appearance, to the Black Spanish, of all varieties of fowls. It is probable that the two races were originally one, and that the faces then were red, as the Minorcas now have them; but the Spanish have been bred with white faces, and spoiled by too fine breeding. The shape is like the Leghorn, but the comb is larger, and there is the red face, the white ear-lobes, and the clean legs. There are two colours, the blacks and the whites, but the latter are very little seen. The metallic black plumage of the blacks makes them very handsome, and they are, for the same reason, very suitable for keeping in towns or in such districts as are not over-clean, from the proximity of factories or works of any kind. As layers, Minorcas are one of the best small breeds we have at present; they are capital foragers and small eaters. They are very good layers when given free range. They lay very large white eggs and a great number of them. The chickens grow quickly, and the young cockerels can be eaten with relish, when three months old. They are amongst the best fowls to be found in India, and are rapidly growing in favour, as they do well both in the plains and the hills.

14. **CAMPINE.**—The Campines are a breed of Belgium fowls of the Leghorn type. They are good layers of large white eggs, and carry a fair quantity of well-flavoured flesh. They are marked with black and



Black Minke Whale.

white bars. The cocks weigh from 5 to 6 lbs., and the hens from 3 to 4 lbs.

15. **HAMBURG.**—Hamburgs are small fowls, but lay very well. There are a number of varieties of this breed. Some of them are very beautiful. They are very much like the Leghorns in quality. They are not common in India, but are growing in favour.

16. **LEGHORN.**—A most useful small breed is the Leghorn. It is a good layer of large white eggs. There are several varieties of this breed, such as the white, brown, black, mottled, buff, and others. Of these, the white and brown are the most useful; they are larger and lay larger eggs than the other varieties. The Leghorn excels as a layer, but is not a good table bird, as it is not much larger than the ordinary country fowl. Many fine specimens of Leghorns are imported every year from England. As a breed for the novice it cannot be beaten as it is a good forager, and is very hardy. Leghorns fly rather well, so need a high fence to keep them in.

The comb of the Leghorn cock should be single, large, erect, and evenly serrated, with five or six wedge-shaped spikes. The hen's comb should be similar in conformation to that of the cock, but carried drooping to one side of the head. There are also rose-combed Leghorns. The face should be red, the lobes a pure white, and with all the varieties the legs should be

yellow in colour. The best birds will weigh—cocks 6 lbs. and hens 4 lbs.

THE POINTS OF THE FOWL

(IN DIAGRAM)

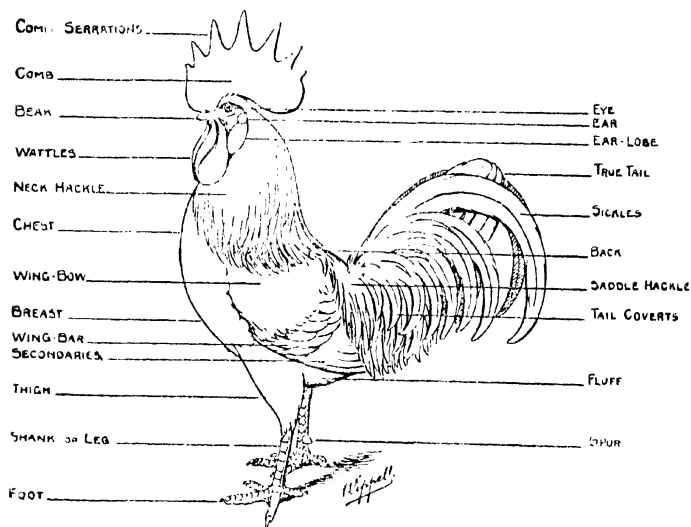


Fig. 25.

17. ANCONA.—The Ancona is really a speckled variety of the Leghorn family.

18. SUSSEX.—The Sussex fowl is the oldest breed of English fowls now existing. It is sometimes called the Surrey fowl. This was one of the ancestors of the

coloured Dorking. There are three recognised varieties of this breed—the Light, the Speckled, and the Red. There are also white and brown birds. The Light ones are marked like the Light Brahma, and are the favourites.

The Sussex fowl is hardy, both as a chicken and later on, and the hen is a very good layer and mother, but the commanding merit of this breed is as a table-fowl. For many years the newer breeds pushed the Sussex fowls into the back-ground, but of late years it has again come to the front and is maintaining its place as one of the best all-round fowls. They are large square-built birds, with close plumage, single comb, short legs free from feathers, carriage erect and graceful. Cocks weigh 9 lbs., hens 7 lbs.

19. RHODE ISLAND RED.—This fowl originated from a cross between the Brahma or Langshan and the Chittagong and the common farm-yard fowls of Rhode Island in America. The mixture of breeds still shows itself in the different types found among these fowls. Some are single-comb, some are rose-comb: some are like the Wyandotte, and some like the Rock in type. The prevailing colour is red, but there are also buff, white, and brown ones.

They are now standardised, and are being bred extensively in England. Their chief value is as prolific layers of large dark-shelled eggs. Being lighter than

the Orpington, they stand the climate of India better. They have improved immensely during the last few years, and are growing in favour, in spite of the difficulty experienced in breeding them true to colour. The brighter red has given place to one of almost chocolate colour. In fact, it seems impossible to get a red too dark. They are inclined to smuttiness in the under-colour. Smutty birds are necessary to breed from, but are of no use in the show pen.

The birds are handsome and keep their appearance better than most breeds. For the novice they have much to recommend them. One fascination lies in the fact that old breeders and novices stand much the same chance of breeding a winner, providing the stock birds are from a reliable source, and are properly mated. The reason for this is, that the breed being yet in the making, there is always the tendency to throw back.

The body should be long, broad and deep, with breast carried well forward and back flat. Legs and feet should be deep yellow, and may show some brown horn colour. Colour of male—a rich dark red with breast as near top colour as possible, both to be well glossed; tail, black. Wing, when open, shows black in both primaries and secondaries. Female colouring should be a rich even shade of deep red throughout, about the colour of breast of male; wing and tail

markings as in the male. Neck hackle usually shows a little black marking at base.

Single and rose combs are allowed but the single combs are more popular. Lobes should be red and eyes red. Weight should be—cocks $8\frac{1}{2}$ lbs., hens $6\frac{1}{2}$ lbs.

20. FAVEROLLE.—The Faverolle is the most popular French breed. It is an outcome of crosses between the Brahma, the Dorking, and the Houdan. There are two recognised varieties—the salmon and the white. In both sexes the comb is single, but they have beards or muffs like the Houdan. They should not have crests. The body is broad, deep, and wide. The legs should be of medium size with scanty feathering. They have five toes like the Dorkings. They are good layers and table birds. The cocks should weigh from 7 to 8 lbs., and the hens from 6 to 7 lbs.

21. MALINES.—The Concau de Malines is the leading variety of Belgian fowls. They are good table birds. Cocks weigh from 9 to 10 lbs., and hens from $6\frac{1}{2}$ to 8 lbs. In type they are like the Langshan. They are an outcome of crosses between the Brahma and the common fowls of the country. There are two colours—the white and the cuckoo.

IMPORTED POULTRY.—Much has been said about the advisability, or otherwise, of importing fowls from England, Australia, America, and other countries.

Years ago, the only wise course to pursue if a pen of pure-bred birds was desired, was to import them. The difficulty in obtaining fresh blood resulted in in-breeding and cross-breeding until the birds had deteriorated to such an extent, that they were not fit to breed from.

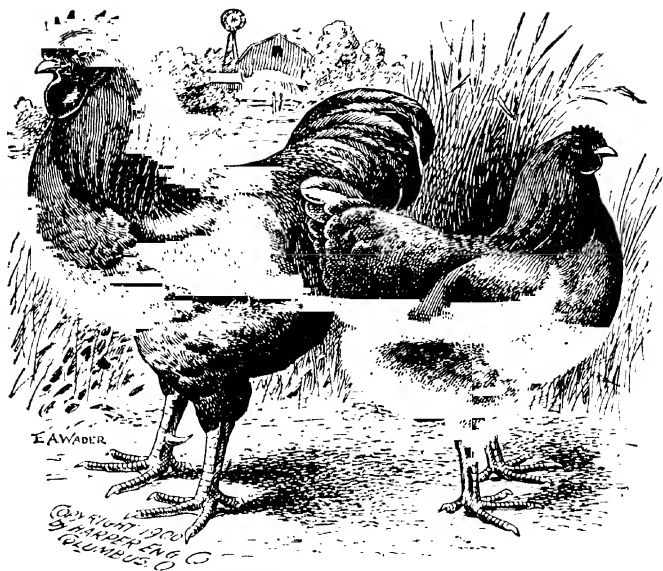
To-day, things are different, and many of our Indian-bred birds can hold their own against those from overseas. It is not unusual for the best bird in a show to be one bred in India, although there may be many imported birds competing. There are breeders all over India, and it is possible to procure new stock entirely unrelated to one's own birds.

Still, the best breeders import, and even novices sometimes send abroad for their first pen of fowls. By doing this, they are keeping in touch with the standards in other countries. All the improved breeds have come from England, Australia or America, and these are regularly being improved upon. Hence, it is better for us to go on importing as we are able.

Imported birds are sometimes seriously affected by the long voyage, and take months to recover, if they ever recover at all.

Others arrive in splendid condition, and look as if they have only been in their crates for a few days.

The exportation of birds from England is becoming a more important business, and greater care is being



PAIR OF BUFF ORPINGTONS.

Fig. 26.

taken to see that they are properly crated, despatched and cared for on the voyage. At the present time there is every chance that the majority of the birds will arrive in good condition, and do good work for their owners.

Birds of 9, 10, or 11 months are the best ones to import, as they stand the journey better, and become acclimatised more readily than the older ones. The best time of the year to import is during the months of October and November. They, then, have the cold weather to become acclimatised, and during that time as many chickens should be reared from them as possible. The hot weather and rains may affect them rather badly, so extra care should be taken of them during these trying months.

If they survive the first year, the hens will probably lay better the second year, and the chickens will be stronger.

Birds, hatched from imported stock, are usually more hardy than their parents and give better results. For this reason it is wise to set every hatchable egg and rear as many as possible. These fowls bring a better price than those from Indian-bred fowls, as do also the eggs from imported stock.

It is a good plan to import a cock and mate it with the hens reared in India, if one cannot afford to buy a whole pen. This brings in the fresh blood so necessary to keep the birds up to the standard and at

the same time the chickens hatched will be hardier than those from imported hens.

The secret of success lies not merely in having good birds to start with, but by carefully selecting, mating and breeding them.

An ounce of experience is worth a pound of theory. There are some things that must be learned by one's own personal experience, and things learned in this way are not soon forgotten.

Keep on trying ; study and work ; work and study. Read all the good books and papers you can get hold of, but do not abandon a good method because someone else suggests, what they consider, a better one. It has still to be proved and much valuable time is lost in changing from one way to another and thus upsetting the fowls. Study your birds, work with them and improve them until you have them as near perfection as is possible. You will not always be successful, but do not be discouraged. See where you have made a mistake and avoid the same error the next time. Experience will cost you time and money ; it will also cost you thought and labour. You cannot procure experience without such expenditure. It is possible to keep poultry for 30 or 40 years and still know very little about them. Poultry-keeping needs thought and labour, just as much as the successful practice of anything else in life.

THE BEST BREED.—Many people ask the question, “Which is the best breed for laying?” or “Which is the best breed for table purposes?” These questions are very difficult to answer, and that for various reasons. Some birds lay more eggs than do some other birds, but the eggs are small; some will lay large eggs, but not very many. Now, what do you mean by a good layer? A hen that lays small and many eggs, or a hen that lays large and fewer eggs? Then, again, all hens of the same breed will not lay the same number of eggs, nor will they lay eggs of the same size. There are bad and good layers among all breeds. It is quite impossible to say which breed is the best layer. It is not so much the breed as it is the special strain or family of the breed that proves good layers; and this strain is made by careful thought and breeding. The same thing applies to birds for table purposes. The best breed for a fancier is the breed he likes best, or has worked longest with. The ideal fowl is the one that is beautiful to look at, will lay about 200 large eggs during the year, and will give a good account of itself when served up on the table. There are such fowls. You will not find many in the market, but you can make them at home if you want to do so. They are the product of money, time, thought and labour. They will do better year by year, if you still work with them. An ideal fowl is not merely a fancy bird with beautiful

feathers and nothing else. It is a bird as large as possible, handsome or even beautiful, carrying plenty of meat and producing a good number of eggs. And such birds can be found among many of the breeds mentioned in this book.

SIZE.—The size of fowls is a subject of some interest. Some very small birds are found among the large breeds, and some small breeds will produce fairly large birds. There are Bantams among Brahmas, Cochins, Rocks, Langshans, Game, and Chittagongs. The Houdan, Minorca, and Leghorn are small birds, but some of them will weigh from 7 to 8 lbs. The size of a fowl is entirely a matter of breeding and rearing. You can produce Bantams from the large fowls, and you can produce large fowls from Bantams, if you will only give thought and labour to it. The correct thing to do, however, is to keep your birds to the standard weight. We do not want freaks, but straightforward honest birds who can be depended on.

The size of the eggs also is a matter of interest. The Cochin family is supposed to lay small eggs, very few weighing more than $1\frac{1}{2}$ ounces. The Brahma also lays only medium sized eggs. The Langshan, Wyandotte, Orpington and Rock lay eggs of good size, usually weighing 2 ounces. The Minorca, Houdan, and Leghorn are small birds, yet they lay large eggs. The Chittagong is a large breed, but it lays a small egg.



SILVER CAMPINE HEN.

Now the size of the egg also is not so much the question of the breed as it is of the strain. By proper selection, mating, breeding and rearing you can make a strain—the family of the breed you have—lay large

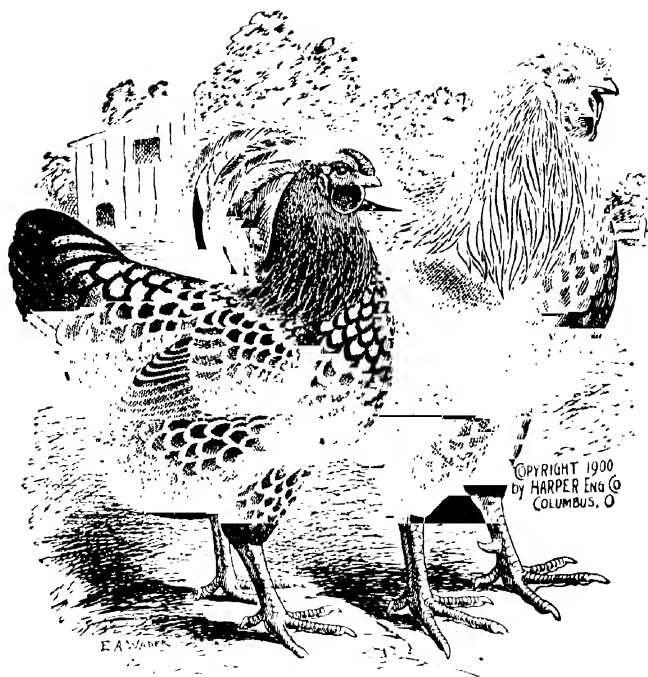
In England, America and Australia eggs weighing 2 ounces are considered to be of the proper weight. You can make your fowls lay large eggs, by hatching from eggs weighing 2 ounces and over. This is a good rule to make and stick to, as only by this means can we counteract the tendency to smaller eggs, that seems to prevail in the trying climate of India.

BUYING EGGS AND FOWLS.—It is much better to buy ordinary eggs from a yard where the fowls are properly selected, mated, and bred, than to buy some grand-looking fowls from a yard where selection, mating, and breeding are neglected. A bird that carries off the first prize at a show may be only the chance bird of a yard where selection, mating, and breeding are not done properly, and that bird cannot be expected to reproduce itself in its progeny. It will be practically useless as a breeder. The eggs procured from the yard of an experienced breeder will produce at least 10 per cent. of very superior chickens that will, in their turn, again produce some first-class birds. Every egg will not produce a bird of equal value, but where a certain quality is being bred for, that quality will be

reproduced in some measure in a portion of the chickens raised from these eggs.

PURE-BRED OR CROSS-BRED.—All the breeds, such as the Brahma, Cochin, Langshan, Rock, Wyandotte, Orpington, Rhode Island Red, Houdan, and the innumerable variety of fowls found to-day are manufactured. The Games and Chittagong are probably the oldest breeds. You can make any variety of fowls by careful selection and breeding, but others have spent a great deal of time, money, brains, and labour in producing the variety of breeds we now have, and what is the use of going over the same ground and trying to produce what has already been produced. Be content to take some of the varieties already produced, and work on them and try to perfect them. You will get better results from what we call pure-bred birds than from birds that have been mixed up together. It may become necessary to put some foreign blood into a breed in order to improve certain points, but this should not be attempted by any person who is unacquainted with poultry culture. When two pure breeds are mixed together, the bad qualities of both parents are more likely to predominate in the progeny than the good qualities, and the further the mixing process goes on, the quicker the progeny will deteriorate.

EGG PRODUCTION AND FERTILITY.—The majority of country fowls lay from 30 to 60 eggs a year. Sixty



PAIR OF GOLDEN-LACED WYANDOTTES.

Fig. 28.

eggs for each hen is a high average. Good breeds of hens will lay as many as 150 eggs, and some have laid 300 eggs and over in 12 months. People are now trying to make hens lay 365 eggs a year. You may not be surprised if some one tries to produce hens that will lay two eggs each day of the year. We sometimes hear of hens laying four eggs in three days and repeating this performance regularly. Nowadays hens are called laying machines. This excessive production weakens the germ and a percentage of the eggs prove infertile. If you want a large number of eggs, you must not want chickens. If you want chickens, you must be content with fewer eggs.

People are very exacting. They want 250 eggs from a hen, and they want 250 chickens from the 250 eggs. If a hen lays 200 eggs in 12 months and you raise fifty chickens from those eggs, you have done well. Large producers are kept not for breeding purposes, but for supplying eggs to the market. If you want a lot of strong, healthy, vigorous chickens, select a good, large, healthy bird in her second or even third year that will lay from 160 to 250 eggs in 12 months, and be satisfied if two-thirds of her eggs hatch. The jungle hen will lay only from 9 to 12 eggs, then become broody and begin to incubate her eggs; such hens will generally raise from 11 to 12 chickens from 12 eggs. They are satisfied with bringing up only three broods a year.

That is what all hens do in their natural state. When they are civilised and educated to produce large numbers of eggs the eggs are less fertile, and the chickens produced are less vigorous, unless great care is taken to feed the parent birds to stand the extra strain.

CHAPTER VII.

BREEDING.

IF permanent success in poultry-keeping is desired, systematic breeding must be carried on. It is only by carefully breeding from the best birds that the great improvement in our domestic poultry has been attained. I would advise every poultry-breeder to keep a copy of "The Illustrated Book of Poultry," by Lewes Wright. The new and revised edition of Mr. Wright's book should be obtained. Also procure all the books on Poultry in India. Those books may not give you any more information than you will obtain from this volume, but you will receive some benefit from the experience of other successful breeders.

Breeding one's own poultry is much cheaper than buying them. They not only cost less money, but the danger of infection caused by diseased imported birds is avoided. Then, again, one is always sure of the blood, or strain, as it is called, of the birds he breeds in his yard. The general rule is, "like will produce like," though this is not always absolutely true of every breed.

THE ART OF BREEDING is governed by a few rules which are simple and easy to understand; and these rules must be faithfully observed if any degree of success is to be gained :—

1. Select only the largest and best formed birds of the breed to breed from.

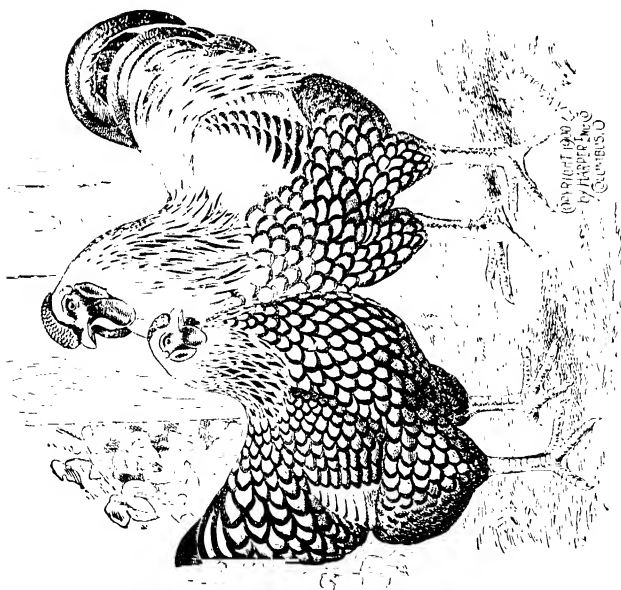
2. Never breed from weakly, sickly, stunted, mismarked or deformed birds.

3. Always select the best layers to breed from.

4. Never breed from cocks or hens under a year old, or more than three-and-a-half years old. The best chickens are produced from hens two years old mated with cocks a year old, or hens a year old mated with cocks two years old.

5. Never breed in—that is, the male bird should always be of a different family from the hens he is mated with, though of the same strain. Never breed from brother and sister. Father and daughters can be mated together and mother and son, also, if the relationship be distant, the birds can be bred from with advantage.

6. To improve the breed, the hen must be mated with a cock that is superior to her. If the cock be inferior to the hen, the chickens will be inferior to their mother; but if the cock be superior to the hen, the chickens will be superior to their mother. An inferior cock will work ruin in a poultry-yard. It is much more economical to pay fifty rupees for a really good cock



PAIR OF SILVER LACED WYANDOTTES.

Fig. 29.



SILVER-LACED WYANDOTTE COCK.

Fig. 30.

to mate with the breeding hens than to buy an ordinary bird for that purpose and pay ten rupees for him. The cock must not only be a good one, but must be from good stock and properly bred. If he is not from a good strain or family, he will not produce good chickens.

7. To breed successfully, proper food and careful management are absolutely necessary.

THE PARENT'S INFLUENCE.—The male parent affects the external structure, shape, size and colour of the progeny and the female parent influences the internal structure—the constitution, temper and habits. The egg-producing powers are transmitted from father to daughter and mother to son, hence the importance of breeding from a really good cock. All chickens from pure-bred parents will not come perfect in all points. Out of a dozen chickens probably only one or two will come up to anything like exhibition standard. Some will be defective in marking, some in size, some in shape, some in comb or leg. The Barred Rock and the Laced Wyandotte are difficult to breed up to standard perfection. They are not very old breeds and frequently throw back. Some of the Barred Rocks will come white, some black, some too light and some too dark. Some of the Laced Wyandottes will come with a little feather on the legs, or defective in marking, or with defective combs. The older breeds, such as the Cochin, Langshan and Brahma and birds of one colour

are easier to breed true, but even they are sometimes defective. Perfection in any bird is the result of continuous care in selection and breeding for years.

STOCK BIRDS.—In selecting a cock for breeding purposes, it is necessary to see, first, that he is of a good size, has bone and plenty of flesh, not merely feathers, broad chest and erect carriage ; second, that he has the right shape of his breed ; third, that he has good colour ; fourth, that he is active and young, but not under a year old ; fifth, that he is perfectly healthy ; sixth, that he is of good parentage—pedigree ; seventh, that he has not been used too much and his powers exhausted. A pure-bred cock with these qualities will improve the birds bred in the poultry-yard.

In selecting a hen or pullet for breeding purposes, it is necessary to see, first, that she is of a good size, has bone and plenty of flesh, but is not too fat, is broad and deep in chest and erect in carriage ; second, that she has the right shape of her breed ; third, that she is of good colour ; fourth, that she is quiet and tame, active and young, but not under a year old ; fifth, that she is perfectly healthy and has moulted quickly and is in no way deformed ; sixth, that she comes on to lay early and lays a good number of large eggs ; seventh, that she is of the same breed as the cock, of good pedigree, and resembles him in colour. A pure-bred hen with the above-mentioned qualities, when

mated with the cock described above, is sure to produce some first-class birds.

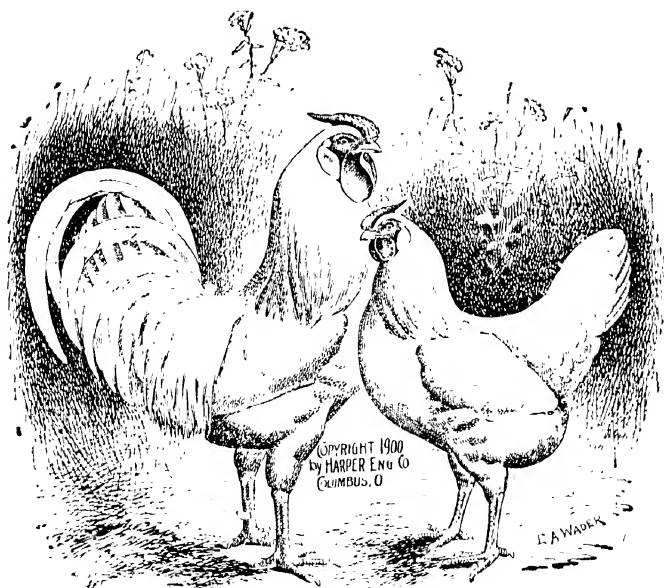
It must be borne in mind that while the quality of the hen only affects the quality of her own progeny, the quality of the cock affects the progeny of every hen in the pen with him. Not only the quality of the cock, but the quality of the progenitors of that cock, not for one only, but for many generations back, will affect the progeny of that cock. Hence no care or money is wasted if wisely spent on the selection of a really good cock for the breeding pen.

Rigid selection is the only means by which the stock can be improved. Every year the best hens and pullets must be picked out of the stock, and mated with the best cockerels and cocks. The cock must always be of a different family from the hens he is mated with, though of the same strain or line. This should be done every year; and the defective and old birds either sold in the market or used for the table. If two or three separate pens of the same breed are kept, the cock of one pen can be mated to the pullets of the other pen, and the cockerels of one pen to the hens of the other pen. With two or three pens of the same breed, a judicious man need not go outside for fresh blood; he will have all the cocks and hens he wants for the most successful pedigree breeding for many years, and effectually avoid breeding with close

relations. This method will insure a good and reliable stock of birds. In a properly managed yard, half the stock of birds will be bred each year, and a third of the old stock will be killed off or sold. A few surplus birds must be kept to fill the places of those that may have to be removed from the pens. Unless this is done it will be impossible to keep up the efficiency of the stock. The cock used for breeding must, in every case, be a pure-bred one ; a cross-bred cock must never be bred from.

PROPORTION BETWEEN COCKS AND HENS.—Very large cocks must not be mated with small hens, and very small cocks must not be mated to large hens. Both birds must be of proper proportions and as large as possible in the large breeds, and as small as possible in Bantams. When one bird is too large and the other too small, the eggs are infertile, and the small hens are seriously injured by the large heavy cocks.

NUMBER OF HENS TO A COCK.—Not more than from three to four hens should be given to a Brahma or Cochin cock ; the Rock, Langshan, Orpington and Game cock should have from five to six ; the Wyandotte and Rhode Island Red from six to eight ; but the Chittagong, Minorca and Leghorn need from seven to ten hens for each cock. As the hens finish laying and leave the run, others must be put in their place. Some cocks will



PAIR OF WHITE ROSE-COMB LEGHORNS.

Fig. 31.

take more hens than will other cocks of the same breed, and some cocks will not be able to serve half the usual number. The number of hens given to a cock depends upon the age and vitality of the male bird, and also the season of the year. Poultry generally begin to moult in July and August, and during July, August, September, and even October, the cock birds are not so active as they are from November to April. The excessive heat, during May and June is very trying and exhausting to some birds. The cocks and hens should be separated during the time of their moult, July to September, and also during the very hot season of the year.

Half the battle of rearing strong useful chicks lies with the parents, for the condition of the breeding stock, especially of the male bird, is of the utmost importance ; the birds must all be fully grown and in the pink of health and condition, neither too fat nor too lean. The best results are obtained when the male bird is removed from the breeding pen at the end of the season and kept by himself and well fed till he is wanted again. He should not be allowed, even during the breeding season, to remain for any length of time in the pen with the hens without a change. Some breeders keep two cocks for each pen of from six to ten hens, changing the male bird every week or perhaps every three or four days.

Too few hens are as great a cause of infertile eggs as too many, and the strain upon the hens is also very liable to cause them irreparable injury.

HOW TO MANAGE COCKERELS.—As a rule, cocks begin to run with the hens much before the time they should. If cockerels are put with hens before they are one year old, they are stunted, and their progeny are not strong and large. Cockerels should be kept far away from hens and pullets in a separate run, shed and house, and properly fed and cared for, until they are a year old, when they should be mated to selected hens.

KEPT SEPARATE.—If more than one breed is kept, each breed must be kept separate, and on no account allowed to run together. They must have separate houses, sheds and runs. When different breeds are allowed to run together, all the birds are ruined and the progeny becomes worthless.

When a person has limited room and means, he should keep only one breed of fowl, and that a pure one. Keep a cock and from four to ten hens according to the breed. A few fowls can be easily managed, and will yield a great deal of pleasure and profit.

When the grounds are large, and the person can afford it, he should keep two or three separate pens of the same breed. When two or more pens of the same breed are kept, and the chickens of the separate pens

are not closely related to each other, the cocks of one lot may be mated with the pullets of another lot, and in-breeding thus avoided, but when all the fowls are allowed to run together, the cocks must be procured from elsewhere.

THE COLONY PLAN.—In a large run, enclosed with wire-netting, or in a garden or field, a colony of from twenty-one to thirty-three birds can be kept with very good results. The run should be at least from 300 to 400 feet long and 100 to 150 feet wide, with a house 10 feet by 15 feet in the centre, and a number of large trees around for shade. In such a run and house three cocks and from eighteen to thirty hens can be kept satisfactorily. Such a number of birds cannot be kept in a small run. If two cocks are put with the hens in a small run, they will worry the hens and start fighting, but when kept on free range or in a colony in a large run as mentioned above, three cocks can be kept together with the hens. When the grounds are large enough, the flock will, as a rule, split into as many portions as there are males, and each lot take to different parts of the run and live in peace. Before the cocks are put together in the pen, they should be kept together by themselves in a small pen and allowed to make friends. They must not be allowed to fight.

MATING FOR COLOUR is a very difficult subject to touch upon: it embraces such a large area that it is

quite impossible to go fully into the subject. As buff seems to be the most difficult colour, we will just say a word or two about this popular tint, which has caused so much haggling and unpleasantness in exhibition circles. As everybody knows, the great bugbear in breeds of this colour is the persistency with which the black feather makes its appearance in the tail; we may breed from birds almost sound in colour, but the youngsters from them may show the black feather to an alarming extent. In mating up a pen of this colour, select a good, *level*, deep-coloured cockerel, even if he does show a little black in the tail (also insist on the black feathers showing a tinge of buff in each one), rather than a so-called self-coloured bird of the “wishy-washy” type. It is advisable in this colour to have the male bird a deeper and richer shade than the female. Very often the buff runs too light and produces white. In some varieties it is quite impossible to breed both males and females of good colour from the same pen.

CROSS-BREEDING.—Breeding cross-bred poultry needs skill, commonsense and knowledge of the characteristics of the different breeds. All crosses are not good. Cross-bred fowls should not be bred from; they should be used for the table and for laying only. If they are bred from, their progeny will be sure to deteriorate. The first-cross is the best. By first-cross, I mean the progeny of a cock of pure breed and a hen of another

Standard of English



W. H. H.

pure breed. If the first-cross hens are bred from, they must be mated to another pure bred cock of the same breed as their father. The cross-bred cockerels or cocks must never be used for breeding.

There is very little advantage to the poultry fancier in producing cross-breeds. The pure breeds are very much more satisfactory both as layers and table fowls, as well as for exhibition. Their eggs and chickens demand a better price, and consequently pay better, while the egg-production can be more easily kept up to the standard.

As a cottage industry the breeding of cross-bred fowls can be advocated. The method is a cheaper one, and one that will have a more rapid effect on the poultry of this country. The aim being merely to provide eggs and fowls for human consumption, the pureness of the birds is not essential while they lay well, and grow to maturity rapidly.

CROWDING.—Another matter of very great importance is never to have too many fowls in one run or house. When fowls are crowded together, they will not lay well, and the eggs they do lay, if not infertile, will produce weak and sickly chickens; not only so, but the fowls will soon become sick and die. Fowls should never be kept in the same house and run with ducks, geese or turkeys. If they are, they will be utterly spoiled.

CARE AND FEED.—A very great deal depends upon the care given to fowls and the food they receive. You need never expect to get good birds without good food and proper care; The best breed will soon deteriorate if neglected or badly fed.

HOW TO KNOW THE BEST LAYERS.—It is sometimes difficult to know the best layers among the hens. Those who keep only a few fowls and watch them closely can often distinguish the egg of each bird. But when many are kept this is impossible. It is always best to keep the hens from which you desire to breed separate from the common stock, and when this is done, it is not difficult to tell which of them are the best layers. An active, intelligent-looking bird, with a bright comb, will, as a rule, be a better layer than a dull, lazy-looking hen.

The safest method is to use trap nests or separate pens. This nest is so constructed that as soon as the hen enters it, the trap-door closes down and shuts the hen in. After she has laid her egg, you liberate her. By this means you can tell how many eggs each hen lays in the year.

HOW TO KNOW THE AGE OF BIRDS.—An experienced hand can tell an old fowl at a glance, but it is rather difficult to impart this knowledge to a beginner; for no one sign is infallible. In general, the legs of a young bird look delicate and smooth, its comb and wattles

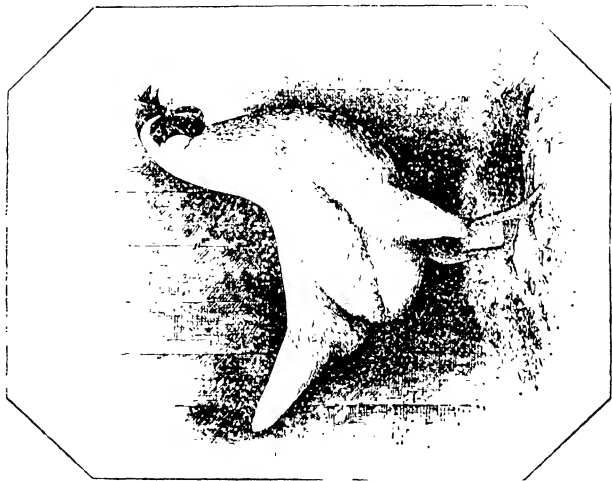
soft and fresh and its general outline, even in good condition, rather light and graceful ; whilst an old one will have rather hard, horny-looking shanks, its comb and wattles look somewhat harder, drier and more "scurfy," and its figure is well filled out. Many of these indications even may be deceptive, especially as "dealers" have a way of making old birds look young. The only advice to give a beginner is to use his own powers of observation, and try and detect the "old look."

FAT HENS.—The breeding stock must never be allowed to become fat. When a hen begins to grow fat, she will begin to reduce the number and size of her eggs. A very fat hen will not lay at all. A laying hen should be in good condition, not fat nor thin. When a hen is allowed to run light she will become ill and stop laying. Laying hens should be kept in a fair and hard condition. If the cock bird gets too fat, he will become dull and lazy, and will be useless in the pen.

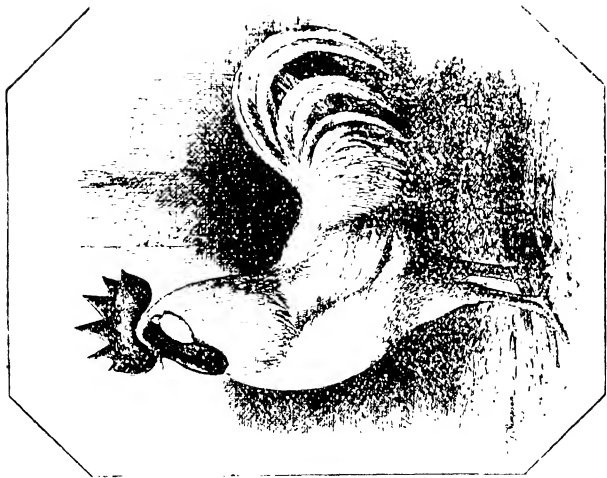
The birds in the breeding-pens must be periodically examined, and if they are too fat, their food must be reduced. The birds must be made to take exercise and scratch for their food.

THE SCIENTIFIC SELECTION OF BREEDING STOCK.—In the selection of birds for breeding purposes, the aim of the fancier should be along the line of both utility and fancy, and his selections made to bring

about good results in each direction. As the development of one does not conflict with the development of the other, there is no good reason why any fancier should not build up a family or strain of birds that excel in both fancy and utility qualities. These qualities are of mutual benefit to each other, and a bird possessing both to a good degree is a better bird and worth more money than one that may be strong in one line and not the other. The utility qualities are mainly those of egg-production, size of body and quality of flesh for market purposes, while those of the fancy are confined to shape of body and colour of plumage. In birds of all classes, except Bantams, good size is an important feature, and this is especially desirable in birds intended for market purposes. This practical feature is also one of equal value from a fancy standpoint. The breeder who raises birds for the market wants good size, and the fancier also desires good size, as it is a standard requirement. It is therefore necessary to select birds as breeders that are of good size, and by size is meant a bird that will reach standard weight without being over-fat. An over-fat bird is never a good breeder, nor is it a desirable bird for the market. It is almost unnecessary to add that good health must accompany good size, and is an indispensable feature in any branch of the poultry industry. In the matter of egg-production, the "fancy" should



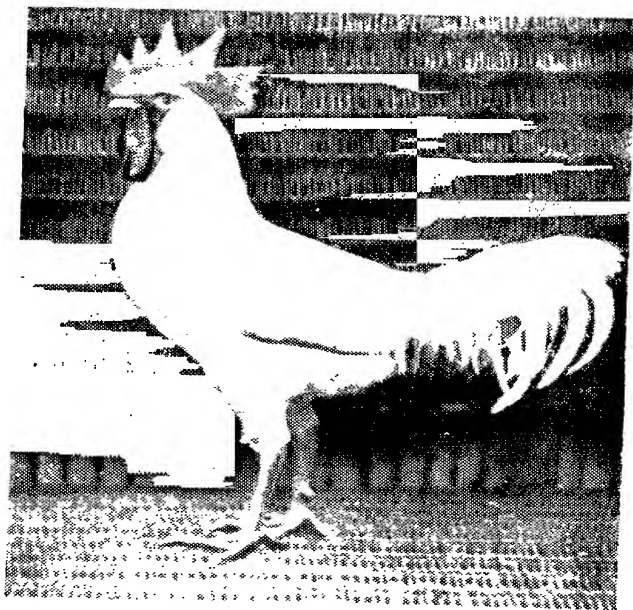
WHITE LEGHORN PULLET.
Fig. 32.



WHITE LEGHORN COCKEREL.
Fig. 33.

give it attention as well as "utility," as it is as important to the one as the other. A female may be of unusual merit as an exhibition specimen, but if she is not a good layer, she is of but little profit to her owner. It is the female that combines the two branches of quality, that is of value. We all desire to raise as many chicks as possible from our best birds, and the number of chicks that can be produced from a female will gauge her value as a breeder—quality of chicks, of course, to be considered. The size and shape of the eggs laid by our hens is also an important feature. Some hens lay small eggs considering their size, and others lay eggs of poor shape, both undesirable features, as the pullets from such females are apt to have the same failing except as modified by the influence of their sire, which may have been a bird from a female that laid an egg of good size and shape. Selections should be made of those females that lay eggs of good size and shape, and also in the selection of our male birds we should consider this matter, and, if possible, use such birds as are from females that are known to lay eggs of desirable shape and size. A few seasons of such selection, and one would have a strain of fowls that would be of more than ordinary value as layers of large, fine-shaped eggs. It is, of course, necessary in order to know the eggs laid by each hen, to make use of some device that will enable us to ascertain this fact without

any chance for mistakes such as the trap-nest. Make it a point to consider the size and shape of the eggs laid by a hen in selecting hens for breeding purposes. It is also a wise plan to consider the disposition of a bird in making selection, especially so in the choice of a male bird. Where possible, other qualities considered, select the one with a gallant, generous, active disposition, one that would give his last bit of food to the females of his pen and go without any himself—a bird that is always polite to his mates and is ever-ready to do battle in their behalf. A male of such disposition will get better chicks and more of them than the bird of surly disposition and lazy movement. It is well, also, to give attention to the disposition of the females, and, as far as possible, select those of the active, energetic type: those that are “hustling” around most of their time instead of sleeping on the roosts or in some comfortable spot,—the kind that make good sitters and mothers. It is not always possible to select birds that possess all of these desired qualities, but one can combine as many as possible, and each season endeavour to make the combination stronger, always working in the direction of the improvement of all these desirable qualities. It can be done if one will only give attention to it. It is by the selection of the “best” in all respects that real progress is made. The ideal female should possess all these qualities to a great degree; and the ideal male



WHITE LEGHORN COCK.
Fig 34

bird should not only possess proper size, disposition, etc., but shou'd be the son of an ideal female. Some may say that we are getting beyond the realm of the practical into that of the ideal when we ask for a combination of all these qualities in our breeding stock. This is not so; it is practical and possible, and only requires the attention of the breeder along this line to bring it about. No one of these good qualities will conflict with another. The selection of our breeding stock should be made with a consideration of all factors that may have an influence in developing and establishing all good qualities in the blood of our birds.

INFLUENCE OF THE MALE BIRD.—The breeding of fancy poultry has been gradually growing out of the realm of the theoretical into that of the practical, and the work of our best fanciers has brought it to a point where it may rightly be termed a science, and if one would achieve the highest success, it must be considered as such, and made a study not in a superficial way, but in a thorough, earnest manner, by watching the results of every move; of every effort; and tracing out the conditions and elements that have been the cause. Along this line let us consider one of the important factors of the breeding problem, and that is the "influence of the male bird," and how it may be controlled so as to bring about the best results

A male bird to be considered desirable as a breeder should have an ancestry of undoubted good quality,—a line of birds that have demonstrated their ability of transmitting their good qualities to their progeny. It is as necessary to work for the establishment of this “breeding tendency” as it is of any feature that pertains to quality alone. No matter how much quality of form and plumage a bird may possess, he is of but little account as a breeder if he has not the power to transmit it to his progeny. Individual excellence is a very desirable feature in all breeding stock, but if it is not accompanied by a power to transmit it to their progeny, it is of but little use in the breeding yard. It is results that tend in the right direction that we are after in our work of the breeding season. A male bird that is possessed of individual excellence and also the power to transmit it to his progeny is a valuable bird for breeding purposes. When such a bird is in our possession, his blood should be used as largely as possible, so that a line may be established that will be most desirable in quality and breeding influence. It is the male bird that introduces the “life element” into the egg and every chick from the mating of which he is the head is of his blood. Not only does he introduce the life element, but by so doing he brings into play the influence of the female also, which, in many cases, may be superior to his own and the chick may follow after

the hen in point of quality and character. So that while the blood of the male bird enters into the life of each chick, it by no means follows that it will be the controlling influence, and will impart to the chick its own excellence, as it depends upon which parent will be the stronger in the power to transmit the qualities of form and colour. A male bird that is mated to several females oftentimes will vary much in the extent to which his influence will be noticeable in the chicks of the different females and this variation will be caused by the difference in the breeding influence of the females. Some of them may be stronger in this respect than the male bird, and others weaker; and the chicks will naturally develop in quality along the line of that of the stronger parent. Where the male bird is the stronger in this breeding tendency, the cockerels will more nearly resemble him in form and colour and the pullets will also show his influence by their resemblance to his female relation, his mother or sisters. In the case where the female is the stronger, the cockerel will show a family resemblance to her sire or her brothers, and the pullets will more nearly resemble herself or her female relation. The stronger-blood influence will tend to produce a quality in keeping with that of the family of the bird exercising such influence. As to which parent possesses it, one cannot tell until the chicks have developed sufficiently to show their quality

of shape and colour of plumage, when one can tell which family the chick most resembles. There are cases, however, where some unknown influence seems to step in and produce a result that is at variance with the characteristics of either family. Where such result is not pleasing in the quality it presents, the breeder had better discard the mating of the male bird with that particular female. Where one makes use of both males and females that tend to the production of the same character of quality, it does not matter so much as to which side shall exert the greater influence, as in either case it should be in the right direction, but where one wishes to produce and continue certain good qualities that are possessed most largely by the line of blood from which the male bird has descended, then it is important that he possesses the stronger breeding power, so that these qualities may be transmitted to his chicks. Even where the male bird possesses stronger power to influence the quality of the chicks than any of his females, these females will vary in the strength of their influence, and to what extent, can only be told by a comparison of their chicks; and to do this with any degree of certainty, one must breed in pairs, so that the eggs laid by each female may be known and marked. This would necessitate placing each female by herself and giving the male bird the run of the pen a short time each day, or every other day, or better still

by the use of 'trap nests.' This last plan would be the easier, and would allow all the females we might

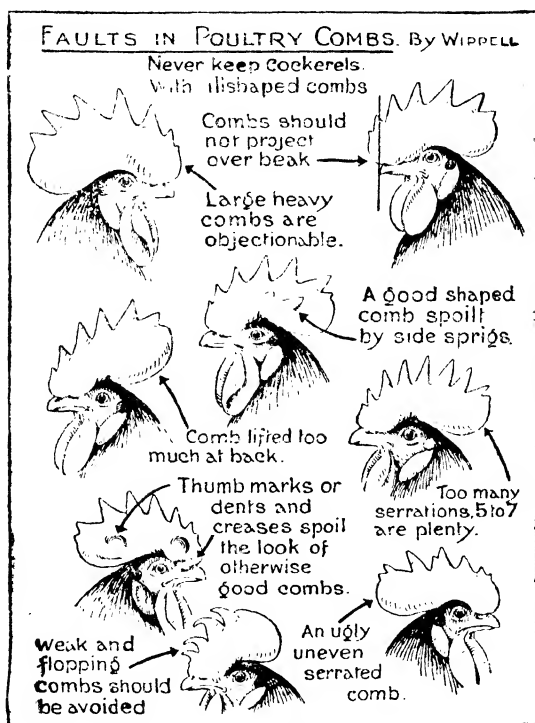


Fig. 35.

wish to mate with any certain male bird to run together and would economise both space and time. The

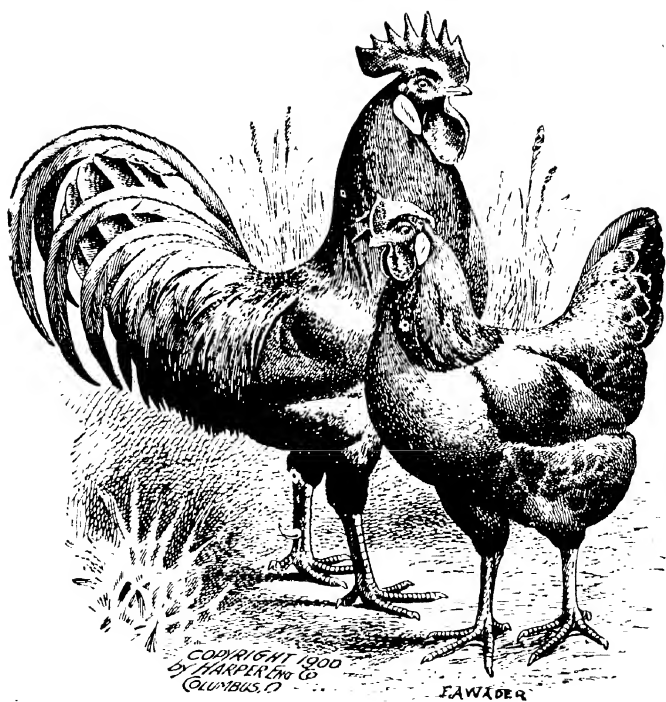
mating in pairs is really the only scientific way of breeding, as it is the only way in which one may determine to a certainty the parentage of each chick and by a study of the quality and characteristics of the chicks, be able to determine which side has the greater influence in the production of the qualities they possess. In the breeding of most lines of live-stock, the work is done in pairs, and it is no trouble to determine parentage, but in the case of fowls, where the young breaks forth from the egg into the life of the poultry world, it is necessary to mark the eggs of each female, and set them so that when the chicks hatch they may be given a mark that designates them as the offspring of a certain male and female. It is the only method by which one may with certainty arrive at a knowledge of the parentage of each chick. It may seem to some fanciers that all this work is unnecessary, and is carrying the breeding of "chickens" to a useless extent, but to the "genuine fancier," the one who makes use of his brain as well as his hands, such work will be recognised as the only line that gives results that may be studied and the influences that have brought them about located to a degree of certainty that is impossible under the old style of breeding. Many men are in the "fancy" for the pleasure it affords them, men of brains and intelligence, to whom the scientific method would appeal as the one most apt to give the pleasure they seek,

and would call for the exercise of the mental as well as the physical faculties. Dame Nature does not give up her secrets easily, and when it comes to the matter of the various influences that possess such power in shaping the results in our efforts in the breeding of fancy poultry, it is necessary that we be able to locate and, as far as possible, control them, and a method or plan that will enable us to do this to the greatest degree of certainty is the one that will admit of the greatest progress.

As the male bird must exert great influence over the quality of his chicks, because of his blood entering into the life of each, it is very important that he possesses qualities, individually and through the blood of his ancestors, that are of the kind we are working to establish in our strain. There is such a difference in the breeding tendencies of the birds of different strains that the only safe way for one to do is to establish a strain of his own and introduce new blood carefully and from a strain that is bred along the same lines as his own—then the danger of conflicting influences will be reduced to the lowest point. One should settle upon the type of a bird he wishes to produce and the style of colour, and stick to them—it, of course, being supposed he will make this choice according to the demands of the standard, and aim to produce a bird that will meet these requirements to as great a degree as possible. In many fanciers' yards one may find

several types of birds, in both shape and colour, and no system seems to prevail. This is not as it should be, as our efforts should be directed along definite lines. The breeding of fancy poultry is becoming more and more of a study to our best breeders, and their aim is to gain all knowledge possible, concerning the many influences that enter into the question of how to bring about the best results in our breeding operations. If these influences cannot be controlled, then only a certain degree of success is possible, and we may not expect to produce birds beyond a limited degree of quality. With such influences brought under control, the limit to quality will depend upon the efforts of the individual fancier and the amount of study he will give the subject. If he looks upon it as a science and considers no part of it as beneath his efforts, he will most likely be successful to a degree that will well repay him, for the time and study he has given the subject. One cannot expect to get much for nothing, and anything worth having is worth putting forth some effort to secure. This is as true of the poultry industry as of anything else, and he who expects to produce birds of high quality must also be willing to master the science, that will give the knowledge, that will enable him to produce them.

AN EGG TYPE.—It is a disputed question whether such a thing exists with fowls as an egg type. Observation.



PAIR OF BUFF LEGHORNS.

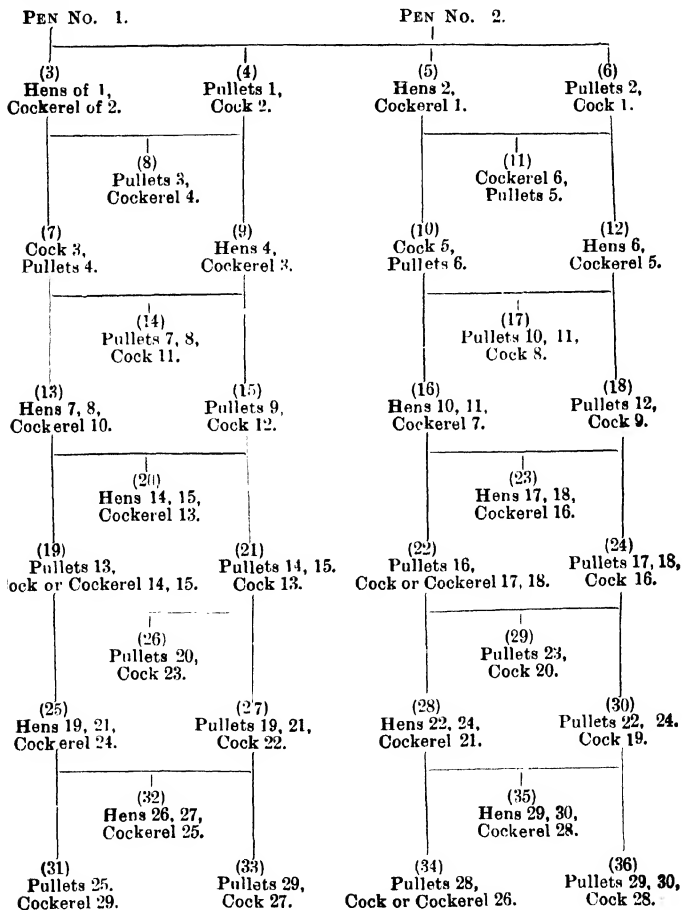
FIG. 36.

however, leads us to believe that the best laying fowls do differ from other fowls of the same breed that are not such good layers. They differ in characteristics that are to be recognized by one who is familiar with his fowls. Theoretically it is perfectly natural and plausible that the pronounced development of certain functions would call for a harmonious structural development of the individual to support this function. For instance, the function of speed is accompanied with lightness of body, high nervous energy, great endurance and pluck and a striking adaptability of size and shape of bone and muscle to do the work demanded with the least waste of energy. In short, it is simply the result of the silent working of the great law of adaptation which has made the pronounced type in all of our breeds. This has been hastened and sometimes hindered by the hand of man. The contrast between the race horse and the draft horse, the milch cow and beef cow the greyhound and bull-dog, the Mediterranean fowl and the Asiatic is but another evidence of the relation between type and performance. These types do not simply happen so; they have gradually developed to be the best for the purpose. When a hen is born with parts better adapted to egg-production than any hen heretofore, she will, with proper care and food, make the largest record. This sounds like a self-evident truth and it undoubtedly is. So is an egg type, but the

egg type does not mean body-shape alone. That's where most failures occur in selection. We must remember that shape is only a factor in the productive power of an individual. A hen may be perfect in form and still be a poor producer, through not inheriting a high reproductive tendency ; just as a locomotive may be perfectly formed in every part to make great speed, but may fail because of poor metal. Some hens with perfect form and inherited prolificacy to be large egg-producers may fail, on account of lack of vitality and vigour of constitution, to withstand the drain upon the system. When, however, these qualities are combined in one hen, we get the highest production. Such a hen will differ in characteristics which will distinguish her from other hens of the same breed which are not good layers. She will have the egg-laying type. Most poultrymen who have observed the hens that are found most often on the nest and have been accustomed to selecting their breeding pens with this end in view, will agree with the statements that have been made. They can quite accurately separate the best layers from the poorest layers. Those breeders who have never before given it a thought, or who do not believe in egg type, should try selecting a pen of the best layers and save their eggs to breed from, and see for themselves whether they do not get a finer lot of laying fowls than they ever had before. The first thing that

PEDIGREE.

Proper Method of Pure Breeding. Begin with two Pens of Fowls.



PEDIGREE CHART.

should be looked for is a fowl that is large and that has a strong vigorous constitution, without which all else is for naught. You will observe the long rangy back and the extreme depth of body from back to keel, and particularly the large fluff. The whole structure indicates at a glance a large development of the egg-producing machinery, and a great capacity to supply this machinery with digested food. There is a decided effeminate, motherly appearance in a good layer in direct contrast to the rooster-headed, thick-necked hen. She is generally very active, inquisitive and friendly, which all speak for great nerve development and intelligence. According to the correlation of parts, she will have a large comb. The condition of the comb is closely related to the strength and vigour of the egg machinery. When only the best egg-producers are kept, then you can feel assured that the chicks from their eggs will inherit their inclination to lay, and by careful selection each year the egg-production of your whole flock will be gradually increased. This increase per hen is a growing profit in her favour that will more than repay the effort for her improvement.

CHAPTER VIII.

EGGS AND HATCHING.

WHEN HENS LAY.—Hens usually begin to lay in February or March and continue laying, with a few intermissions, until July or August, when they go into moult. The hens usually begin to moult in July or August, and get through it in September or October. During this time they should be separated and not forced to lay. Some hens lay during October, November, December and January, but not many will do so. By careful breeding fowls can be got to lay in October, November and December. The price of eggs is highest during the cold season, and it is a decided advantage to the owner to be able to put eggs into the market at this season.

Pullets generally begin to lay when they are from six to nine months old. Birds hatched in December, January, February and March will begin to lay in October or November. Pullets hatched in April, May and June will begin to lay in January to March. Those hatched in July and August will lay in March and April.

Pullets hatched in October and November will lay in May and June. The second year these hens will begin to lay a month or so later than they did the first year; and birds above two years old will not begin to lay until February and March or later.

Chickens hatched in January, February, March and April will be ready for market in the cold season, when they will sell for better prices.

THE BEST TIME TO SET HENS.—The best time to raise chickens altogether depends upon the climate in which the chickens are to be raised.

The best time in the hills and cold climates will be the worst time in the Punjab and United Provinces, and the best time in the United Provinces will be the worst for some other places where the climate is very wet and damp.

There are certain parts of India, such as the Punjab, United Provinces and Central Provinces, where the heat is very great and fatal to chickens, but the rainy season is most favourable to them, as the rainfall in these parts is not so heavy. There is also sufficient green food and insect-life for the chickens. The hot winds during April, May and June kill a large number of chickens, but they will do very well in July, August and September. March, April, May and June are the most favourable months for raising chickens in places like Simla, Naini Tal, Mussoorie, Darjeeling. Assam,

Dooars, and wherever the cold is very severe during the cold season, and the moisture great during the rains. In Eastern and Lower Bengal, Tirhoot, and all parts of India where there are no westerly hot winds, chickens can be raised most successfully from October to the end of March.

Chickens raised during April, May and June thrive very well in places where hot winds do not blow, when sufficient shade and green food are provided and perfect liberty allowed. During this period large numbers can be raised and kept at nights in open sheds, but care must be taken not to overcrowd the birds or keep them too warm. It is not advisable to hatch chickens in Bengal during the hot weather, except in the cooler parts of the province.

Chickens hatched during the first three months of the year grow large enough to take care of themselves during the rains; the only special care they need is to keep them out of the water and storms. They grow rapidly during June, July and August, and commence to lay from September to November.

Wherever the rainfall is not heavy—does not exceed from 40 to 50 inches during the year—chickens can be most successfully raised from the 15th June to the end of August, if the hens are not moulting. A few years ago the rainy season was considered to be very unfavourable to poultry raising, but on close investigation and

experiment the following conclusions were arrived at:—

The rainy season must be a suitable time to raise chickens, because:—

(i) Most birds in their wild state raise their young from the 15th June to the end of August. They go into moult in September and are through by the end of October.

(ii) During the rains there is plenty of green food for the birds.

(iii) During the rains there is a great deal of animal food natural to poultry.

(iv) During the rains the trees and shrubs are in full foliage and afford sufficient shade and protection to the birds.

(v) During the rains many of the hens, especially the Indian breeds, lay very well, and the eggs are very fertile.

(vi) Chickens raised at this period grow fast and become large and strong enough to go through the cold season.

All these conditions are in favour of poultry raising. The only things to guard against are the frequent showers and heavy rains; the chickens have to be taken up into shelter immediately it rains, and as soon as the rain stops and the ground is dry again they can be allowed out once more.



701AS

Eggs are very fertile during the rains, and the chickens hatch out well, but very special care is needed to protect the little ones from chills, and at the same time not to keep them confined too much. Those who raise chickens during the rains must provide a good large covered run and shelter for the birds. It is always a good plan to hatch some chickens during July and August, if possible.

Chickens hatched from October to the end of January do very well in all parts of India except the hills, if they are given proper warmth and more nourishing food and are carefully protected from the cold winds and from wet and damp. January, February, March and April are the most favourable months of the year, and chickens can be raised successfully in the plains in nearly all parts of India.

The climate varies very much in different parts of India, and the best time is not the same time in every place. Raise your chickens at the time of the year best suited to your climate, but give the birds rest while they are moulting. Do not set the eggs of birds that are in moult, and never set a hen that has gone into moult.

SELECTION OF EGGS.—The selection of eggs for setting is a most important matter; for on the eggs depend the qualities of the forthcoming brood. The following rules must be faithfully adhered to:—

1. Only eggs from the best hens must be set.

2. Only fresh eggs must be set. By fresh, is meant eggs not more than three to five days old in the hot weather, and not more than seven to ten days old in the cold season.

When kept under proper conditions, eggs can be kept for eighteen to twenty-one days during the cold weather, and when set will hatch successfully, but such eggs should be set under hens and not placed in an incubator.

Fresh eggs, if all be well, hatch out in good time and the chickens are strong and lively; the stale ones hatch later, and the chickens are often too weak to break the shell. Even when stale eggs have hatched subsequent deaths sometimes occur in this portion of the brood. When all the eggs are fresh, the chickens hatch out within a few hours of each other, and losses are few.

3. Very small and very large eggs should be rejected. Only eggs of an ordinary shape and with a smooth surface should be used for hatching. Different breeds of fowls lay different-sized eggs, but the size of the egg does not always indicate the size of the fowl it will produce. The Leghorn and Minorca lay the largest eggs although they are small fowls. Brahmas and Cochins, while being the largest fowls lay rather small eggs. Larger eggs than usually laid by the fowl should not be selected for hatching. Very large eggs are

generally double-yolked, and very small ones sometimes yolkless.

4. Eggs intended for hatching must not be shaken, exposed to the sun, kept in wet or damp places, or placed in water. No oil, dirt or other liquid substance must be allowed to touch them, and they must be kept away from strong and bad odours. The eggs must never be kept in an air-tight vessel.

5. If a breeding pen is not properly mated, the eggs from that pen will not be a success. A badly mated pen will produce weak and otherwise defective chickens.

6. There are many theories abroad about being able to tell the sex of the chickens in the eggs, but none of these theories are proved by facts. The most plausible idea is that the first half of the eggs laid are female and the second half of the number laid are male, but even this is not correct. Some people will tell you that the long eggs will produce males and the round ones females; such ideas only reveal the ignorance of those who entertain them.

Several instruments are now on the market for the purpose of determining the sex of the chicken in the egg. Even these can not be depended upon. Sometimes they are right and sometimes they are wrong.

SELECTION OF THE MOTHER.—Pullets of the first year, usually, are not good sitters and mothers. The

second time a hen becomes broody, she will usually sit well and be a good mother. A wild, quarrelsome or fidgetty hen will make a bad mother.

The hen selected for sitting must be in perfect health, and have all her feathers on her. A bald hen or one minus some feathers or in moult should never be selected for hatching, for she will not properly cover her eggs. The hen should be examined to see that she is free from lice and disease.

The hen should be thoroughly broody. A broody hen can be recognised by her constant determination to sit in her nest. She will scarcely go out to eat, and will make a peculiar clucking sound and ruffle her feathers when she is touched. Many persons put eggs under a hen when she is not properly broody, and consequently the eggs are destroyed. Some hens will sit in their house for days, but when put on eggs are very troublesome, and will stand on the eggs and often break them. Such hens must be avoided.

Hens will sometimes lay several eggs after beginning to sit. Every egg placed under a hen should be marked distinctly so that the egg laid in the nest may be detected and removed.

The best time to set a hen is at night, as then she is more likely to settle down to her work. Besides, if the eggs are put under the hen at night, the chickens are more likely to appear on the night of the 21st

day, and will have the whole night to rest and gain strength.

PURCHASING CLUCKED HENS.—When you have to buy a clucked hen, you should buy one that has been set on eggs and been sitting for three or four days. Buy her together with her eggs and nest, place her nest in a quiet place, and let her sit for a day and night undisturbed, place food and water near her. After she has been sitting for twenty-four hours, remove her common eggs and put the good eggs under her. It is a good plan to allow a hen to sit on common eggs for a day or two before giving her good eggs.

THE NEST.—The nest on which the hen is placed must be made in a quiet corner where she will not be disturbed. Make a box twenty inches high and fifteen inches square; the top and sides must be made of half-inch mesh wire-netting, and the bottom and lower part of the sides of planks, with a door made of half inch mesh wire-netting, fifteen inches square, on one side. Put five inches of fine dry earth or ashes in the box, make an oval excavation and cover this with a thin even layer of soft broken hay. Place the eggs on the nest in this box, and gently put the hen on the eggs and close the door. In such a box as this the hen and eggs will be safe from the other fowls and from cats and rats, and she will have plenty of ventilation. The box should be thoroughly rubbed over with kerosene

oil, and then well whitewashed both inside and outside. Flowers of sulphur or insect powder should be sprinkled over the nest once or twice a week. Great care must be taken to prevent lice infecting the box and nest.

Another way of making a nest is this: Take a small *gumla* or earthen vessel about fifteen inches in diameter and eight inches deep, fill it three-quarters full with finely sifted dry earth or ashes, press down and make a hollow, like the inside of a saucer, sprinkle some flowers of sulphur over the nest, and put the eggs on this, gently place the hen on the eggs and leave her alone. The nest must be placed where the hen will be safe from cats, rats, etc., and away from the other fowls. Great care should be taken to provide a nest just large enough for the hen to properly sit in. The nest must not be too large, or else the eggs will roll away from under the hen and become chilled and spoiled. If the nest is too small, the hen will crush the eggs in her effort to get in and out of the nest and in turning the eggs. If the nest is only large enough for the hen to cover comfortably, she will sit properly and treat the eggs well.

It is always best to have a separate house for sitting-hens. If they are kept in the same house as the other fowls, or where they will be constantly disturbed, they will not sit well, and will spoil their eggs. If two or three hens only be put on eggs, they can be kept each in a different outhouse or godown and be let out



BLACK-TAILED WHITE JAPANESE BANTAM
Fig. 38.

once or twice every day ; but if a number of hens be set, it is advisable to have a separate house and run for the sitting-hens, and place all the nests in this house, the nests should be placed at least six feet apart. All the hens can then be let out of their nests together, and put back in half an hour.

A sitting-hen must not be kept in a damp, dirty, draughty or badly ventilated place.

HOW TO TREAT SITTING-HENS.—Before putting the hen on the eggs, she must be placed under a *tappa* or basket and fed and watered ; a plentiful supply of good grain must be given. It is a good plan to set a hen on half a dozen common eggs, and allow her to sit and settle down for two or three days, when the common eggs should be removed and the good eggs placed under her. This will ensure the safety of the good eggs. She must be allowed to remain undisturbed for about twenty-four hours after she is placed upon her eggs. On the second day, and every subsequent day, she must be allowed out once or twice a day. Some hens leave their nests twice a day. It will do no harm if she does, so long as she is not allowed to keep off her eggs for more than twenty minutes each time.

The hen must have a plentiful supply of good whole grain wheat or paddy and pure water, but no soft food. The food must be given when she comes off her nest, and never given in the box. If the food is given at a regular

hour every day, she will come out exactly at that hour. A box of dry earth or ashes must be kept in the yard, where the hen can easily get to it. After she has eaten she will take a dust-bath and rid herself of the vermin that may be troubling her. Unless a dust-bath is provided, the hen will get covered with vermin. If the hen keeps away from her eggs longer than twenty or thirty minutes in the hot weather and ten or fifteen minutes in the cold weather, gently drive her into her box or room and close the door.

Hens ought to come off their eggs at least once every day. They require the few minutes run and daily supply of food. The temporary change from the cramped position is good for them and the exposure to the fresh air greatly benefits the eggs. If the hen will not come off her nest, she must be gently lifted off at a given hour every day. Unless this is done, both the hen and the eggs will be injured. The person who lifts the hen must carefully feel under her wings before removing her from the nest, in order to make sure that no egg is being held there. She must be lifted gently, by placing both hands under her wings.

When the nest and hen are treated with flowers of sulphur or insect powder regularly once or twice a week, they will be perfectly free from lice. If the hen is troubled with lice, her nest and box must be changed, and some insect powder and flowers of sulphur must be

sprinkled over the new nest and rubbed under the hen's wings, and over her head and back.

Your success with the eggs depends in a very great measure upon the hen under which you put them. If during the first three days the hen does not sit properly, the germ will not form ; if about the middle of the period of incubation the hen neglects the eggs, they will be addled ; if at the latter part of incubation the hen fails, the chickens will die in the shell. Infertile eggs will remain clear like new-laid eggs. If an egg becomes rotten, then be sure it was fertile, but has become addled. Some hens will spoil every egg placed under them. Some hens in turning their eggs fail to properly cover one or two eggs in the nest ; the next time they turn them they take the exposed ones in and allow one or two others to remain uncovered : in this way they will spoil every egg in the nest. Some hens take to breaking and eating the eggs. Frequently a good hen will spoil her eggs if she is tormented by vermin, rats, cats or people. Hunger or disease will also cause a hen to neglect her eggs. A good hen, if properly cared for, should raise 7 chickens out of 9 eggs if the eggs be sound. In many cases the eggs are spoiled by the nest not being made properly, or the hen and eggs not receiving proper attention before setting.

HOW TO TREAT THE EGGS.—After the eggs have been placed under the hen, all that needs to be done

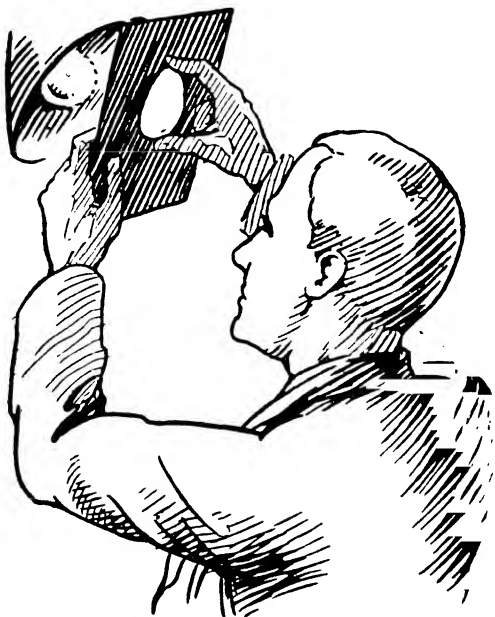
is to inspect them every day to see that they are all right.

Sometimes an egg gets broken in the nest ; when this happens, remove the remaining eggs and wash and dry them carefully ; change the earth and ashes of the nest ; if there be any of the broken egg sticking about the hen, wash it away as well. Unless this is done, the remaining eggs will be injured. The water used for washing the eggs and hen must be 102°F., no colder and certainly no hotter. As soon as the eggs and hen have been cleaned and dried, the eggs must be placed under her in a new nest.

Should an egg get chipped or indented, so long as the skin below the shell be not broken, there is hope for it. The flaw should be patched up with gummed paper. A good thing to mend such a flaw is the marginal paper round sheets of postage stamps. Many eggs have been saved in this way, and the young ones have been successfully hatched. The gummed paper must be only large enough to cover the flaw, and must be held to the egg with the finger or palm of the hand until it properly sticks to the shell. If the skin under the shell be pierced and air have got into the egg, there is no hope of saving it.

Infertile and addled eggs must be removed from the nest. The following is a simple method of testing the fertility of eggs:—Take a piece of stout card-board

(the cover of an old book will do), and cut a hole in it the shape of an egg, only a little smaller, place one of the eggs sideways against the hole, and then hold up to



METHOD OF TESTING EGGS.

Fig. 39.

the light ; the light must be as strong as possible, but the egg must not be brought closer than six inches to it. If the egg is perfectly transparent, like a new-laid egg,

it is infertile ; but if a small dark body is seen floating about the centre of the egg, it contains a chicken. The eggs should be thus tested on the fourteenth day after setting. It is impossible to tell if an egg is fertile or not until the 7th or perhaps the 10th day after setting. An egg that is quite clear after being twenty-one days under the hen is infertile ; if the egg has a partly-formed chicken in it, or is rotten, then it is addled ; if the chicken is fully formed and is dead in the shell, it is spoiled. If the germ has formed in the egg and not hatched, it was fertile, but has been addled or spoiled by some cause or other for which the eggs may not be to blame. The following is a good method of testing eggs :—On the nineteenth or twentieth day after setting fill a large bowl with warm water—the temperature of the water must be exactly 102° , great care being taken that it is not colder or hotter—place the eggs in the water. After a minute the fertile eggs containing live chickens will wriggle in the water ; this is caused by the chickens endeavouring to make their escape from the shells. The infertile and addled eggs will float about, but will not wriggle. Sometimes the chickens will be heard to cry in the eggs when they are placed in the warm water. The eggs must be allowed to remain only two minutes in the water, and then taken out, properly dried and put back under the hen.

Some persons occasionally sprinkle warm water over the eggs. When the weather is very hot and dry it may be necessary to do this in order to give moisture. In Bengal it is not often necessary to sprinkle the eggs.

On the twentieth or twenty-first day the chickens will begin to appear. Now, the hen must be fed, carefully put back on the nest and left alone for twelve or twenty-four hours. Occasionally the hand must be put under her to find and remove the egg-shells. These vacant shells, if not removed, may become attached to the other eggs and prevent the chickens from coming out.

The chickens need no food for the first thirty or thirty-six hours, so they must be left under their mother undisturbed for about twenty-four hours. If after twenty-four hours there be some eggs under the hen still unhatched, these eggs should be placed under another hen, and the chickens, with their mother, removed to a clean and warm box. Some chickens will be later in hatching than others, so it is a very good plan to set two hens on the same day, and, when the chickens are hatching, give the early ones to one hen and the ones hatched later to the other hen.

A day or two before the chickens appear the nest and eggs must be sprinkled with flowers of sulphur and after the chickens and hen have been removed from

the nest, they should be gently rubbed over with Keating's insect powder.

Rats often steal eggs and chickens from under the hens and they sometimes kill the hen. The only remedy is to keep the hen with her eggs or chickens in a box with a good strong bottom and half-inch mesh wire-netting top and sides.

Should any of the chickens be unable to get out of the shell, they may be aided, but if they cannot get out themselves, they are generally not worth the trouble to rear. The best way to help the hatching is to place the egg, with the chipped portion out of the water, in a bowl of warm water (102°); keep the egg in the water for a couple of minutes, and then return it to the nest. This will soften the shell and enable the chicken to break it. Breaking the shell is dangerous, for if blood is drawn, death or deformity will be sure to ensue.

NUMBER OF EGGS UNDER A HEN.—The size of the hen and the state of the weather must decide the number of eggs to be placed under her. If the hen be large and well-feathered, and if the weather be dry and warm, then from nine to twelve large eggs may be placed under her; if the weather be cold, eight to nine should be given. Small hens should have only six eggs in the warm weather and four in the cold weather. If the eggs are small, more may be given. No more eggs should be placed under a hen than she can comfortably

cover. It is better to place too few than too many. In the cold weather the chickens need shelter and warmth ; if they do not get it, they will die, so a hen should not be given more than six to eight chickens when the weather is cold.

HOW TO KEEP EGGS.—The quality of the eggs to be set must be above suspicion. In order to ensure this every egg should have legibly written upon it in pencil or ink the date on which it was laid. The best way to keep eggs is as follows :—Have a large board (as large or as small as necessary) with a number of oblong holes, about an inch and a quarter or an inch and a half, bored in regular rows an inch or an inch and a half apart. Fix this board on a stand of four legs, and place the eggs, the larger ends downward, on the holes. This egg-stand must be kept in a quiet, clean, dry and properly ventilated place, where the eggs will not be exposed to concussion, noise, bad odour or heat. Turn the eggs over once a day.

Some breeders insist that the eggs should be laid on their sides, if wanted for hatching, and turned regularly every day. A good tray can be made as follows :—Take a piece of nice smooth wood, as large as is convenient. Nail a beading all round it to prevent the eggs from falling off, then nail tiny strips of wood in parallel lines across the tray. These should be placed about $1\frac{1}{4}$ inches apart. Legs can be fixed to

the tray if desired. The eggs can be kept quite safely in a tray of this description.

HOW TO TREAT EGGS WHICH HAVE TRAVELLED.—Eggs which have been brought by train or otherwise travelled, run the risk of being broken ; not only so, but they are very liable to become spoiled. Before being set under the hen, if the eggs are taken out of the box and kept in the stand at rest and free from jar for twenty-four hours, they have a better chance of hatching. They must not be kept standing for more than twenty-four hours. The journey injures the germ, but by being rested it seems to recover from the injuries. Eggs are not injured so much in travelling by train as by post. A great deal depends upon the distance and season of the year the eggs have travelled, and also upon the treatment the eggs receive after reaching their destination. If fifty per cent. of travelled eggs hatch out, it will be a great success. A great deal also depends upon the way the eggs are packed.

PUTTING THE HEN OFF THE CLUCK.—To put a feather in the nose of the hen and duck her in cold water is cruel and as ineffectual as injurious. The best method is to place the hen in a coop with a barred front and barred bottom and place it in a corner of the shed raised a foot from the ground. Keep the bird in this coop, and give her plenty of grain and water. This will effectually break the cluck in a few days.

It is not always wise to refuse to allow a hen to sit. She needs the rest, and it will be well to allow her to remain on the nest for a week or ten days, even if there are no eggs to place under her. If a hen is not allowed to rest, but is forced to lay, her eggs will prove infertile.

HOW TO PACK EGGS.—Eggs for hatching should always be packed in proper egg-boxes, when it is desired to send them any distance. These boxes are of cardboard and are divided into small compartments—each compartment being intended to take only one egg.

Wrap each egg in soft paper, so that it fits firmly into its compartment. Then there is no fear of the egg bumping about and cracking, unless the box is allowed to fall.

Close the box carefully and tie it. Then pack it into a basket with plenty of straw around it. Close the basket and sew the lid on firmly.

If to be sent by rail or post, the basket should be sewn up in hessian and properly sealed. Many dozens of eggs are stolen annually before they reach the purchaser's hands and it is only fair for the seller to do his best to ensure the safe delivery of eggs that leave his yard.

It is wiser to have a handle on the basket as there is less likelihood of it being thrown about instead of

being carefully lifted. A rope handle is quite good and does not increase the freight of the package, as the ordinary basket-handle would.

If boxes are used instead of baskets they should never be nailed down. Screws should be used instead and the box sewn up in hessian to guard against it being opened, *en route*. It should also have a rope handle, or a handle made of strong string.

Purchasers should not be too quick in writing sharply about the non-success of a setting, for often the blame may be traced to their own door; and, if not, one severe fall at a station or one heavy jarring will ruin the whole success of a setting. We sometimes hear of failures among the eggs of our honest and most upright vendors, whose other eggs sent out have done well, and the cause can only be attributed to some such accident as mentioned above. That a handle easy to lay hold of is of great value to every egg package we are quite sure, and would recommend purchasers to insist upon having it. We would also add that much acrimony would be avoided between purchaser and seller if the latter placed a notice on each package sent out, to the effect that eggs before being put in an incubator or under a hen should be rested for twenty-four hours.

PURCHASING EGGS.—When it is necessary to purchase eggs for setting, they should be obtained from persons of good repute who are experienced breeders

and not novices. Some persons, thinking they are economical, get the cheapest eggs that are to be had, and when the chickens hatch out and grow up are surprised to find them good for nothing. Getting cheap eggs for setting is altogether false economy. A few annas more for each egg would often result in each chicken being worth a few rupees more.

The great majority of people know little or nothing about poultry. They have no good poultry book and read no poultry paper. Their ignorance leads them into many mistakes. Then, again, some people think that whatever they have got is the best, and whatever other people may have is not worth keeping; such people are not to be relied on; their judgment is not to be trusted.

If a person gets a name for supplying first-class eggs and fowls, he will prosper; while if he does not keep his word, if he indulges in "tricks of the trade" selling stale or infertile eggs for fresh and good ones, old fowls for young ones, diseased birds for healthy ones, or cross-breds for pure breeds, people will quickly get to know his ways and will leave him for some one who is honest. "Honesty is the best policy," even in poultry-breeding.

It frequently happens that the person who buys eggs or fowls is very ignorant about the quality of the breed and the treatment of the eggs, and his ignorance

leads him to misjudge the seller. If the eggs are not treated properly, they certainly will be spoiled, and the seller cannot be accused of selling unsound eggs. Sellers are often abused for what has been entirely the fault of the buyer. One man keeps his eggs standing for three days after he receives them before he puts them under a hen ; another man takes the eggs out of the box and immediately sets them under a hen. A third puts the eggs under a hen and covers her over with a small basket and allows her out once in three days. Another trusts his servants to such an extent that they feel safe in changing the eggs under the hen and substituting common ones. When the results prove unsatisfactory, these people feel that they have been defrauded by the persons who supplied the eggs.

Some people do not know what a bird should be like. They want to know why a Light Brahma has black on her hackle and tail, or a Dark Brahma white on his neck and back, or why a Cochins has a tail, or why a Langshan has such few feathers on its legs, and a lot of such absurdities ; and conclude by saying that they have been duped in the birds they have purchased. Such people should spend six months on a poultry farm or else invest in a few first-class poultry books and papers, and devote a few months in studying them before they attempt to breed fowls. It is well for people to remember that every bird of a pure breed is



not a perfect bird fit for exhibition. First-class exhibition birds are very rare and expensive. The reason is that it needs especial breeding and rearing to produce certain qualities, and not more than one in 50 or 100 chickens of the purest breed will possess all those qualities required by the standard of first-class exhibition in England, America, and Australia. Frequently first-class show birds have been sold for from £50 to £150 each. The time may come when in India we can get grand exhibition birds for 20 and 30 rupees each, but for the present we must be satisfied if we can get really good pure-bred birds for breeding stock for that amount.

TO BUY EGGS OR BIRDS.—If a person wishes to get good reliable stock economically, and if time be no object, he should visit some reliable poultry breeder, or else write to him, and arrange to purchase six lots of eggs from him, twelve eggs in each lot, and set these eggs under good country hens and raise the chickens. He should get eggs of only one breed. The best way to do is to get half of the eggs between October and December, and half between February and March. Even if half the eggs hatch and half the chickens are reared successfully, this will give him eighteen fowls for the money he would have had to pay for two or three birds if he had bought them. If a person has the money and is willing to use it, he should purchase a cock and three

hens of the breed he wants, and proceed to raise the chickens. Before the eggs or fowls are purchased, the fowl house, the run, coops, etc., should be made and kept ready to receive them when they arrive. It is not wise to purchase the fowls first and make their houses and runs afterwards.

EGGS FOR SETTING.—There is every reason to believe that the next season will be a repetition of former ones in the matter of occasional unsatisfactory results obtained from eggs purchased for hatching purposes. The very nature of the business makes this a foregone conclusion, and as the number of persons becoming interested in poultry for the first time runs into the thousands, it is perhaps timely and appropriate to mention some of the conditions affecting the business which, while thoroughly understood by older breeders, will be in the nature of instructions to the army of purchasers above referred to. Buying eggs is something of a lottery. We often see the statement that, "Like will produce like," meaning, as generally interpreted, that high scoring birds will produce their equal. This is only partially true, and amateurs should not be misled by it. Any breeder who has ever mated a pen of birds knows that a majority of the progeny will not be the equal of the parent stock, and this is true even when line breeding is intelligently practised. This precludes the possibility of getting all prize-winners

from a setting of eggs. The blood lines in the various families of fowls are more or less antagonistic and the mating of high grade specimens will often bring out the latent characteristics in the progeny and defects will be developed which do not show in either of the parents. These conditions are probably responsible for more dissatisfaction than any others. They are the agencies which influence the hatch as far as the quality of the progeny is concerned. In regard to the number of chicks produced, there are obligations to be fulfilled upon the part of both buyer and seller, and which both parties to the transaction should duly consider. The seller should keep his breeding birds in the best condition. In the first place, they should be of just such quality as he represents. They should be entirely free from disease. They should be vigorous and hardy and of strong vitality and not exhausted and worn out from too prolonged service in the breeding pens, or bad management. They should not be over-fat and the chances of fertility thereby lessened. They should be kept as free from lice as eternal vigilance can make them. Crowded quarters and too close confinement should be avoided. Animal and green food should be provided if the birds are not on good range. In many cases the male birds need to be fed separately. Care should be taken to see that the matings are congenial to the individual specimens. Eggs should be kept in a reasonably

even temperature. Care should be used in packing for transit both in regard to the manner of packing and the chances of the box or basket to stand rough handling. The buyer likewise has a few obligations to fulfil before he can justly criticise the seller. He must remember that, according to the established rule of trade, he assumes all responsibility for the welfare of the eggs after the shipper has delivered them to the Railway Company in good condition. If the package is exposed to bad weather by the Railway Company at some railroad station, or the germ is started by the eggs remaining a couple of days in an overheated waggon, or if some messenger drops the package on the floor or platform and jars the eggs enough to injure them, these are not the faults of the seller, but are some of the chances the buyer takes. Then, there are several things after the receipt of the eggs for which the buyer is responsible. It should be remembered that some hens, even though they sit steadily, are not able to generate enough heat to properly incubate a setting of eggs. This may be a natural condition, or it may be the cause of the ill-health of the birds. Too many eggs should not be placed under a hen. Twelve eggs are too many. The hen should be free from lice so that she will not be compelled to leave the nest or stand up in it for relief. It is possible for her to sit too steady and ruin the hatch. She may leave the nest too long

at a time when you do not see her. She may get off at dusk and not find her way back till day break, and you cannot say absolutely that she stuck to the nest unless you saw her every hour out of each twenty-four. Much may depend upon the make-up and location of the nest, especially under certain conditions of the weather. After the chicks are hatched they must receive proper care and feed, or they will never develop into prize-winners even though they have the foundation for these characteristics. If you have had an unsatisfactory hatch, do not write the seller a nasty letter, but consider whether or not you might be at fault.

Now, for the buyer of birds, for he has a duty also to perform. First, he should write for first-class stock if that is what he wants. He should not write for something nearly as good, or for culls, or for birds "for only breeding-stock," unless he expects just such fowls to be sent him. No man ever got prize-birds by pretending that he only desired something else. Frankness and truth are essential. When eggs are bought, the buyer must be prepared for incubating them. He should then not be in a hurry, after the chicks are hatched, to raise objections. Wait awhile for results. The chicks will show their quality when they are six months old.

Then there is Nature as a factor. No man can "guarantee" eggs to hatch. An egg is one of the

“unknowable” things, and both the seller and buyer should understand that fact. Even two settings of eggs from the same flock may not give the same results with different hens as sitters. If buyers will consider this matter, they will be better satisfied in their dealings. Always remember Nature’s laws, and do not overlook the position of the poultry-breeder, who must sustain his reputation, yet has no control over the germ of the eggs, the vigour of the embryo chick, the conditions of incubation, or the natural laws of reproduction. He can only send the buyer the eggs from hens kept under good conditions, but he cannot tread within the dominion of Nature.

Careless expressmen, improper handling and various obstacles for which the buyer and seller are not responsible, are also causes of disagreement; for eggs are fragile things, and no man in any business has so many drawbacks against him as the breeder of poultry. Considering that the breeder sells “future life,” he is more honourable than may be supposed, for he has the buyer, Nature, the railroad company, and sitting-hens, all combined as factors in the transaction. Yet he is not always happy—when he reads his correspondence.

Fortunately, these things are better understood than formerly, and the “kickers” are not as numerous now as they have been in the past.

DAY-OLD CHICKENS.—Some breeders sell day-old chickens. As soon as they are hatched the chickens are put in specially made boxes and sent distances of 500 or more miles. As they need no food for thirty-six hours, the long fast and the journey do them no harm. Before procuring the chicks, you should have a good hen or a box-foster-mother ready to receive them.

BREEDS AND UTILITY.—The breeder delights in fine specimens of the breed he prefers, but many of those interested in poultry have no inclination to devote their time to the breeding of beautiful birds only, but prefer to realise a profit from chickens and eggs, and hence any attempt to sacrifice vigour and strength in order to secure a straight comb or a certain shade of colour, receives but little attention from those who prefer poultry for eggs and market. It is difficult to secure a flock that is uniform in every respect. This is proved from the fact that, while the breeders of fancy poultry have been more exacting in their standard requirements about colour than any other class of breeders, yet they have not succeeded in securing a stock of uniform show birds from the best of their prize-winners, while the breeders of cattle and sheep, who give but few points to colour-marks, have only a small number of culls in their herds or flocks. The farmers who raise poultry for market, however, owe much to the breeders of fancy poultry, for despite all the mistakes they may

have made, they have preserved the purity of the breeds, and the time will come when all the fancy breeds will combine the characteristics of utility.

PURCHASING FOWLS.—After you have purchased a fowl or fowls, and they arrive at your yard, don't take them out and judge immediately whether or not they are satisfactory or suitable. Remove them from the coop and place them in a quiet place by themselves. They have been cooped up and roughly handled for some days, and are tired, hungry, excited and shaken up. Let them get rested, refreshed and groomed a bit before you judge them. Fowls are somewhat human. Ride from Bombay to Calcutta yourself, in a drawing-room car if you please, and the first thing you want is a good cleaning up, something to eat, and a rest before you go out to attend to your business. You want to make a good impression, don't you? Then, why not give the fowls a chance? This may not seem of very great importance to some, yet it "cuts lots of ice," as the Yankees say, and you know 'tis the little things that count. People improve sometimes when you are better acquainted with them, and the same thing applies to fowls.



WHITE WYANDOTTE COCKEREL.



UTILITY WHITE WYANDOTTE HEN.

CHAPTER IX.

REARING CHICKENS.

A VERY great deal depends upon the way chickens are treated during their growing stage, for such treatment very largely controls their size and stamina. A large percentage of chickens die from sheer neglect or mismanagement. Chickens of all breeds cannot be treated alike or kept in the same coop. Chittagongs should be kept separate from chickens of other breeds; if kept with other chickens, both the Chittagongs and the others will suffer. The Chittagong, the Game, the Langshan, the Rock, the Orpington, the Wyandotte and the Silkie should be kept each separate from the others. The Brahma and Cochin may be reared together, but even they do better when kept separate. The Chittagong, Game, Langshan and Silkie must not be kept confined; they need large runs, plenty of exercise and extra animal food. They must also be carefully protected from damp, wet and the hot sun. The Rhode Island Red, Rock, Orpington and Wyandotte do not need as much liberty as the Chittagong or Langshan, but they must have a great deal of liberty

and need to be carefully protected from damp, wet and the hot sun, and also need greater care in feeding. The Silkie does best when allowed to run at liberty with its mother and fed on rice and wheat. The Brahma and Cochin can be kept more confined as they are heavily feathered, and are not so active, but even they should not be confined too closely ; they need more nourishing food and to be fed oftener, but little at a time. After they are a week or ten days old they need more liberty. The reason why each breed of chickens needs to be kept separate is because some breeds grow faster and develop quicker than others, and some are more active and quarrelsome than others, and each breed needs different treatment. If all are kept together, the backward and less active ones will suffer, and the forward and active birds will be injured.

THE FIRST FEED.—For thirty-six hours after hatching chickens require no food ; but it is not advisable to leave them longer than that without it. Thirty hours after the chickens are hatched, they should be taken out of the old nest, and, with the mother, placed in a clean box, or put on the clean floor under a basket, in a warm, dry and quiet corner. The mother must be fed apart from the chickens ; a liberal supply of good whole grain wheat must be given to her and a supply of drinking water. After the mother has been fed she must be put with her chickens on the floor under

the *tappa*, or in the box. Care must be taken that the chickens do not swallow the grain given to the hen. Do not feed chickens on hard-boiled eggs, because they thrive better without it. If given at all, the egg should be mixed with some coarse oatmeal or wheat-meal; if given alone, it is liable to cause indigestion and diarrhœa. The best food for the first three days is stale bread-crumbs moistened with milk, and oatmeal and broken wheat given alternately. The oatmeal should be given very sparingly. Morton's oatmeal is the best for this purpose. This should be scattered on the board upon which the chickens are placed. The hen will call out the chickens from under her, and they will soon begin to pick up the food. A very small quantity only should be given at a time. The food must be given little and often—every two hours. Care must be taken that the board or ground upon which the food is given is quite clean. A handful of coarse sand or finely-sifted grit must be scattered on the board on which the chickens are fed.

HOW OFTEN TO FEED THEM.—Chickens must be fed from six to eight times a day until they are six weeks old; after that, and until they are six months old, they must be fed four times a day. The first feed every day must be given a little after sunrise. The last meal must be given at sunset. Only as much as the chickens will eat up at once should be given at a

time. Nothing should be allowed to remain on the feeding board.

WHAT TO FEED CHICKENS ON.—For the first three days give bread and milk, oatmeal and broken wheat in very small quantities every two hours. After the third day the morning meal should consist of equal parts of finely ground oatmeal, barley meal, pea meal and coarse wheat-flour, sufficiently moistened with milk so that it will not stick to the fingers when pressed and will easily crumble, or a little stale bread moistened with skimmed or fresh milk. The other meals during the day should consist of Morton's coarse ground oatmeal and broken wheat given dry. A very little cooked rice may be given once a day, mixed with wheat-bran and *atta*, especially during the hot weather. Small millet or *bajra* can also be fed to the chickens. This can either be given dry or soaked for an hour in hot water.

During the hot weather give very little oatmeal, and more wheat and *bajra*. At first the wheat should be broken very small, but as the chickens grow larger the grains should be larger, until at three months of age they receive whole wheat. A very small quantity of "Poultry Powder" given in the soft food to chickens will prove very beneficial.

If preferred the mash can be given dry instead of being mixed with milk or water. It should be placed

in small dishes and the chickens allowed to peck at it as they wish. A small feed of broken grain should be fed to them night and morning. The grain can be mixed to ensure the chickens getting a little of each kind every day.

Twice a week a little finely-chopped onions and garlic should be given. After the sixth week some finely-chopped half-cooked meat and raw onions mixed with wheat-bran can be given every other day. Do not give raw meat. White-ants and earth-worms are very good for chickens; they eat them greedily and should be given them every day. When a good supply of white-ants is given, the meat is not necessary. Finely-ground fresh bones must be given when neither meat nor white-ants are obtainable. Chickens fed on white-ants thrive well and grow rapidly. Some fine sharp shell grit, charcoal and pounded old mortar must be given to the chickens every day along with the grain on the feeding board; sharp grit is indispensable.

Oil-cake is very good for growing chickens. After they are three months old they should be allowed some mustard seed oil-cake or linseed oil-cake with their food once a day. Some chickens will eat it by itself if mixed with water and left in a plate; but the best way to give it is to pound the cake up into powder and mix it with water, allow it to stand for two or three hours and then mix it with the bran. Give only a small quantity.

Chickens must be allowed green food from the second day of their life ; without it they will not thrive. Young tender mustard cress or lettuce or tender *doob* grass is the best for young chickens. Chopped lucerne is also very good.

WATER.—Chickens must not be allowed water for the first three days when they are fed on eggs. If egg is not given, water may be allowed on the second day. After that the chickens should always have water before them. The water must be perfectly clean, and given in a shallow vessel. The following plan is a good one :—

Fill a cup with water, put a saucer over it turned upside down, and turn the cup and saucer over. The cup will now stand topside down in the saucer, and there will be a rim of water all round in the saucer. This will give an ample supply to the little creatures, without the danger of their drowning themselves or polluting the water with their dirty little feet. The cup must be without a handle. Any similar contrivance will do. The two things necessary to guard against are the chickens drowning or wetting themselves, and their polluting the water.

A few drops of Condyl's Fluid, or a small quantity of Permanganate of Potash should be added to the drinking-water every day. This will prevent a great deal of sickness and trouble. The quantity of Permanganate of Potash should be only sufficient to colour the



WHITE PLYMOUTH ROCK COCK.

Fig. 42.

water a light pink. A few drops of Parish's Chemical Food should occasionally be added to the drinking-water. Occasionally a little camphor water put into the water will be beneficial.

The mixture recommended for white diarrhoea may be used in place of any of these with advantage. It is to be understood there is no harm in any of them but a great deal of good. Still poultry-keepers must be guided by their own experience in these matters.

GREEN FOOD.—Chickens need green food from the second day after they are hatched. They are very fond of tender green *doob* grass, and they need nothing better. From July to November they will find all the grass they need ; but during the cold weather and dry hot weather grass will be scarce and some green food must be provided. Nothing can be better than lettuce leaves and young onions chopped very fine. Onions should be given in very small quantities and only two or three times a week, but lettuce can be given every day with benefit. Sometimes chickens get diarrhoea from eating too much fresh green grass or too many onions. Lettuce never does any harm. Mustard cress is also very good for chickens.

ANIMAL FOOD.—Animal food in some form is absolutely necessary for chickens. White-ants are unquestionably the best thing that can be given to them ; in the absence of white-ants, boiled meat or

clean freshly ground bones must be provided. The entrails of the goat or sheep are the best meat to give. The tripe should be properly cleaned and boiled and minced finely before it is given. Fresh bones cleaned and pounded into powder is also very good for chickens. A small quantity of freshly ground turmeric should be mixed into the meat or ground bones before it is given. Turmeric given in small quantities is a preventative against disease. Milk and curds are splendid food for chickens. White-ants and milk can be given every day from the first day, and meat and bones should be given when they are a month or six weeks old and then not oftener than every other day. During the rains the chickens if allowed their freedom, will pick up all the animal food they need, but during the hot weather and cold weather, when animal food is not very abundant in the fields and gardens, some must be provided.

A splendid form of animal food is found in fish-meal. It can be mixed with the dry mash, or wet mash, as the case may be. When supplied with fish-meal chickens do not need any other kind of meat.

Only a very small quantity should be given at the start and this should be gradually increased as the birds grow older.

GRIT.—Chickens must be provided with some coarse sand, fine gravel and finely broken and sifted flint. A small quantity may be placed on the feeding board, or

else a large quantity placed in an open box in the run. It must never be mixed with the food.

MIXTURE OF FOOD.—The following make a splendid mixture of soft food for chickens from about two months of age :—

Whole wheat-meal	..	..	two pounds.
Finely ground barley	..	..	one pound.
Finely ground gram or peas	..	..	two pounds.
Wheat-bran	..	..	three pounds.
Linseed-meal	..	..	one pound.
Precipitated Phosphate of Lime	..	..	half pound.

Add a tablespoonful of Poultry Powder. All should be properly mixed together. Give moistened with butter-milk or skimmed milk. Make into a crumbly state and give only a little at a time twice a day. The principal grains for chickens should be coarsely ground oatmeal and coarsely ground wheat. *Doob* grass and lettuce are the best green food. Give the grain dry and on clear ground.

COLOUR OF CHICKENS.—Don't condemn your chickens. Many inexperienced breeders not knowing that the chickens of some varieties are not true to feather when first hatched, jump to the conclusion that they have been swindled, and make a great ado about nothing. One must live and learn.

NEGLECT.—Many amateur poultry-raisers neglect their chickens when they get to be eight or twelve weeks

old for the younger broods. This no doubt is because it is thought such chickens can look out for themselves better than the smaller ones, and so they can to a certain extent, but neglect at this period of their lives often results fatally. The reason that care should not be remitted, at this time especially, is because the down or nest feathers which heretofore have enveloped the body are being shed and full-grown feathers are taking their place, thus causing a constant drain upon the system. It might rightly be called the "first moult" and of course one can readily understand there is not the strength to meet this in the young chicken that there is in the adult fowl, therefore let there be no relaxation in care and attention while our feathered pets are donning their new clothes. Animals shed their coats. Dame Nature has provided for the renewal of the covering of birds, fishes, insects, and reptiles also, and in this "getting on of new coats" fowls are included. The old feathers gradually fall off and the new ones take their place with an added lustre and silkiness of texture that is pleasant to the eye of the onlooker and comforting to our pets themselves.

CLIPPING WINGS.—The wings of growing chicks require an occasional clipping. The wings grow so rapidly on such breeds as the Leghorn, Chittagong, Langshan and some others, that all the life and vitality

of the chick are exhausted thereby, and many die from this cause. Many a chicken's life has been saved by clipping its wing feathers, even after it has begun to droop.

EXAMINE THE VENT.—Chickens are often troubled with white diarrhœa. The passage at the vent becomes stopped up. The chicks suffer much pain and begin piping, and, if not attended to immediately, will die in great agony. Examine the vent, remove the excrement from around the vent, bathe the part with warm water and Permanganate of Potash, dry with a soft cloth and apply some vaseline or salad oil. Keep the bird separate for a day or two in a dry place. Put a few drops of olive oil down the throat and feed on bread and milk.

If the chicken is very bad, the best thing is to have it destroyed, as even if it recovers it will not be fit to breed from.

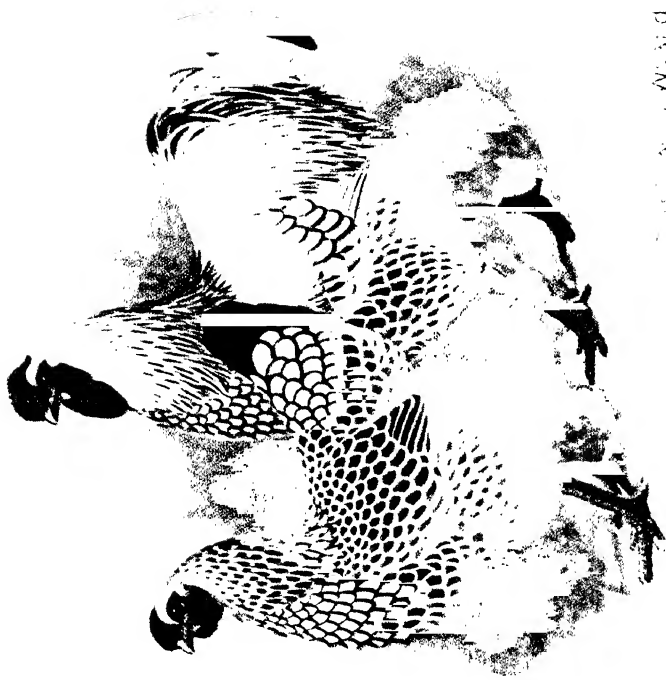
If the following solution is given in the drinking water from the time of hatching until the chickens are four weeks old, and then given twice a week for the next few weeks there will be very few losses from white diarrhœa.

Zinc sulphocarbolate	..	..	15 grains.
Sodium sulphocarbolate	..	..	7½ „
Calcium sulphocarbolate	..	..	7½ „
Mercury bi-chloride	..	..	6 „
Citric acid	..	..	3 „

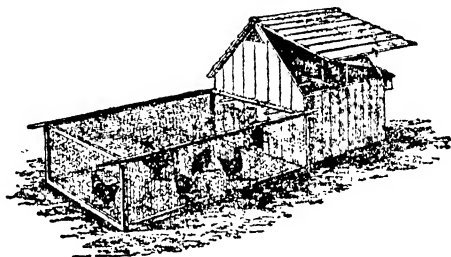
The above is to be dissolved in one gallon of water, and the mixture used as drinking water, without dilution.

OVERFEEDING.—One of the greatest dangers of chickenhood is overfeeding. If adult fowls are kept in confinement and overfed, they will become overfat and cease to lay or they will be troubled with diseased liver and fatty degeneration of the heart. When young chickens, before they are old enough to digest the food, are given a large quantity of food at one time, they will not be able to assimilate it and will get their stomachs and livers deranged. A very large number of chickens are killed by injudicious and excessive feeding. The proper method is to feed every two hours or so and give only small quantities that can be eaten up at once. Then, again, very young chickens must be given only such food as they can digest : food of too heating and stimulating a nature is injurious. After chickens are three months old there is less danger of overfeeding ; between three and eight months is the period when they grow rapidly and fledge out fully, and they can assimilate larger quantities of food. At this time they need extra food of good bone and muscle-making substances. If the method of feeding mentioned in the previous section is followed, there will be no danger of overfeeding or underfeeding.

BROODER AND RUN.—Make a box three feet square, with wood bottom, top and sides. A door made of a



wooden frame and wire-netting must be fixed in front. There must be proper ventilation, but no draughts. The run should be six feet long and three feet wide, and 21 inches high. Make a wood frame, nail wire-netting on the three sides and top, over the netting place some



BROODER AND RUN.

Fig. 43.

thin canvas or cloth, so as to keep the wind out during the cold and windy weather; put a mat or gunny on the top of the run during the day to protect from the sun. Such a box and run will do well for a hen and 12 chicks, or for 18 chickens alone for the first month.

THE RUN.—For the first three days the chickens must be kept with the mother under a small *tappa* or in a box during the day. If the day is bright and the ground dry the *tappa* should be placed on short grass in the compound. But if the ground is wet, or the weather damp, they must be put in a box with sand

or dry earth in the bottom, and kept under a shed. For the first three days chickens need to be kept in close confinement; because if they are allowed to run about much their strength will be overtaxed. On the fourth day they need a little freedom, and must be placed under a *tappa* or run three feet in diameter. On the fifth day they must be removed to a proper run. A run six feet long, three feet wide and twenty-one inches high will be sufficient for a dozen chickens until they are a month old. The covered box or coop must be attached to the run to protect the chickens from the rain and the heat of the mid-day sun. Such a run will save a world of trouble and anxiety, and prevent the brood wandering and getting tired before they are old enough to bear the strain. After the chickens are a month old they should be let out with their mother for two hours in the morning and evening. When they are six weeks or two months old, they must be allowed out the greater part of the day. The run must be shifted every day and placed on fresh grass. The chickens must be protected from the heat of the sun, as a large number die from sunstroke. During the hot weather the runs and coop must be placed under the shade of trees or covered over with thick mats or gunny.

If chickens are kept in close confinement, they will droop and die. When kept confined long, they begin to pipe, and this will prove injurious to their health. They

must be kept contented and happy, and they are most contented and happy when they run about and scratch for themselves. When chickens are six to eight weeks old, they should be allowed perfect liberty with their mothers. Only during the hottest part of the day and during wet weather should they be kept closed up in their coop and run. It is best to keep the chickens in their coop or in their run during the morning, when the grass is wet with heavy dew, but the earlier they are let out, the better.

SHADE.—Chickens should be carefully protected from the sun and hot winds. A large number of valuable chickens die from the effects of the heat. The run must be placed in the shade in a cool place, and there should be plenty of large shrubs and small trees on the ground under which the chickens can run about and take shelter and scratch during the day.

CROWS AND KITES.—The greatest enemies chickens have in India are crows, kites and hawks. One cannot too carefully guard against them. Chickens must always be kept under a covered run, and, when let out, be watched by some person to protect them from these birds and cats.

AT NIGHT.—The chickens with their mother must be properly cooped at night so as to be safe from cats, rats and thieves, and kept away from draughts and wet. The coop must be large enough and sufficiently

ventilated to be comfortable. Damp, dirt, overcrowding and want of proper ventilation are fruitful causes of disease.

A couple of inches of dry earth or sand must be placed in the coop on the wooden floor.

KEPT SEPARATE.—The hen with her brood must be kept away from the other fowls, or else she will be constantly fighting, and injure or destroy the chickens. Two hens with chickens must not be kept in the same run, or very close to each other; for they will fight and peck each other's chickens to death.

Chickens of different sizes must not be kept together. The larger ones will ill-treat the younger ones and injure them permanently. Nor should chickens be kept with adult birds. When chickens of the same size, age and breed are kept together in small numbers in a good run and large pen, they thrive very well.

INJURIOUS PRACTICES.—Some people remove the little horny scale which appears on every chicken's beak; they have an idea that this will enable them to pick better. This practice is as stupid as it is useless, and often proves positively injurious to the little birds. Another foolish and hurtful practice is putting food or pepper-corns down their throats, and dipping their bills in water to make them drink.

The best thing to do is to *leave them alone*, and let them pick up their own food.

GROUND.—Experience has proved that it is almost impossible to rear chickens on ground that has been contaminated by full-grown fowls or continuous broods of chickens. Chickens will never thrive on ground upon which ducks, geese or turkeys have been kept. New ground or ground properly dug up and turned over is the best for chicken rearing. The chickens' runs must be large, clean, shady and with a lot of good *doob* grass growing on it. Once a year, at least, the ground should be dug up and the earth properly turned and a large quantity of sharp flint grit, slaked shell lime and old mortar scattered over the ground. If possible, a crop of mustard should be raised on the ground every cold weather.

CLEANLINESS.—Absolute cleanliness is very essential, even more so than for grown-up fowls. If the boxes, coops, grounds and runs are allowed to become tainted with their excrements and stale food, it will be impossible to successfully rear them. The sand or earth in the coop must be continually changed, and the run moved every day to a fresh place.

VERMIN.—Chickens will not thrive if they are covered with vermin. The best way to keep them free from insects is to rub some Keating's insect powder on their heads, bodies and under their wings; and to occasionally wash their boxes with a strong solution of Phenyle and water, and dry in the sun. If the coop,

house and run are not kept perfectly clean it will be impossible to keep the chickens free from vermin. Paint the boxes and all the woodwork with seven parts of kerosene oil and one part of coal-tar, Stockholm-tar is better, properly mixed together.

WET AND DAMP.—If young birds are kept in wet or damp spots, they cannot thrive. Wet and damp cause a great many deaths among chickens. They should never be allowed out during unsettled weather.

PERCH.—Chickens under six months of age should never be allowed to roost on perches. Doing so will make their breast-bones crooked and will disfigure them for life. Chickens should be bedded on a thick layer of sand or dry loose earth. The sand and earth should be sprinkled over with flowers of sulphur and with kerosene oil or a strong solution of Phenyle.

COOPS AND HOUSE.—It is best to keep only ten or twelve chickens in each coop at night. A coop for twelve chickens between three and six months old should be six feet long, three feet wide and two feet deep. The top, sides and front should be covered with half inch mesh wire-netting, the bottom should be boarded, and the front should have a door for the chickens to get in and out. The coop should be kept in an open godown or sheltered shed. Only chickens of the same age and size should be kept together. When kept in this way, they thrive nicely. After the chickens are

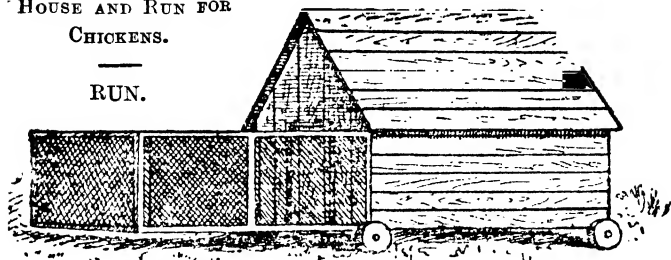
HOUSE AND RUN FOR
CHICKENS.—
RUN.

Fig. 44.

Chicken-coop with wire run, which may be left out at night without fear of jackals or cats. There should be a lid to the coop to get at the hens and chickens and for cleaning the coop, which should have a bottom and a piece of gunny thrown over the wire-netting during bad weather and at night. The above is a most useful construction, and is a protection not only against animals but kites and crows. Though a little expensive, it will repay itself well.

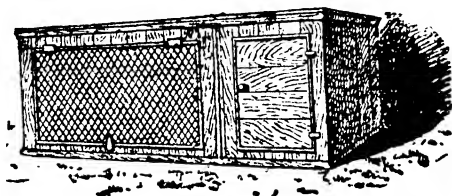
COOP WITH COVERED RUN ATTACHED
FOR CHICKENS.

Fig. 45.

six months old, they should be allowed to roost in a fowl-house.

The coops should be kept very clean and kerosene oil and tar constantly applied to all the woodwork.

WEEDING OUT THE STOCK.—A most important factor in successful poultry-keeping is to avoid overcrowding. In those yards where chickens are reared chiefly for the table, they are disposed of as soon as they are fit to eat, and the weeding out process is carried on all through the season. The tendency, in fact, under these conditions, is rather to diminish the stock too much. It is forgotten that some of the January—March pullets ought to be retained as the principal birds to be looked to for eggs in the winter. In many yards, where a good many chickens were to be seen in January and February, there are in October and November only a few late hatched young ones, the older chickens all having been killed or sold : a clear case of killing the birds that would have laid the golden eggs. With those people, however, whose space is limited and who keep pure-bred fowls, sometimes with a view of exhibiting, there is a disinclination to reduce the stock for fear some of the birds disposed of may ultimately turn out well. Even if the chicks have no pretence to good looks, the fact that their growth has been watched from day to day, and that they have been made pets of by the owner, causes him to be unwilling to part with them.

Still, the health of the poultry is bound to suffer, as well as the profit side of the account, if the stock is not reduced to reasonable dimensions. Sentiment must be discarded if the fowls are to be kept on business principles, to realise the greatest possible profit. Some chickens when two months old will show very marked defects, others will not develop their true qualities until they are four or six months old. Whenever it is seen that a chicken is very defective and unfit to use in the breeding pen, it should immediately be sold for table purposes or killed for dinner. The hens that are three years old should be got rid of before they begin to moult. It is better to take a rupee or two for each, which is generally the most that can be obtained for old hens, than to feed them for months, when they are not paying. Of course, if a bird is especially good from a fancy point of view, she should be kept on longer, though for laying a large number of eggs a hen will have seen her best days by the time she is three years old. Neither is it advisable, except under special circumstances, to keep the cock birds after they are four years old. They often remain a long time in the moult when they are of that age, and are of little use until February and March.

In arranging to reserve certain birds and to weed out others, the composition of the flock for the ensuing breeding season must be taken into consideration. It

is a mistake to keep young birds only. If both the parents are only a year old, the chickens from such an alliance fledge more slowly, mature less quickly and seldom grow as large as those that are bred from three or two-year old hens, mated with a cockerel, or from a three or two-year old cock running with fine, early hatched twelve months old pullets.

Some extra birds must be kept to be put in place of those that leave the breeding pens.

THINGS YOU OUGHT TO KNOW.—Chickens of all black breeds such as the Black Langshan, Black Orpington, Minorca, etc., when first hatched, have a great deal of white and yellow about them, but these feathers are gradually changed for pure black ones.

The largest birds do not lay the largest eggs. The largest eggs do not produce the largest fowls. The size or colour of the egg does not indicate the breed of the bird that laid it.

The Barred Rock, Dark Brahma, Laced Wyandottes and other partly-coloured chickens when hatched are very different in colour to the parent birds, but they gradually assume their proper colour.

Pure black birds frequently produce pure white chickens. The White Langshan was produced from the Black Langshan, the White Minorca from the Black Minorca.



ROSE-COMB MINORCA COCKEREL.
Fig. 46

The Buff varieties are inclined to breed very light and even white.

You cannot tell the freshness of an egg by shaking it ; if you shake an egg or place it in water, you will destroy the chance of its hatching.

Locality, food, weather, house and run, and the treatment you give the birds will affect the production of eggs.

All improved breeds among birds and animals (also human beings) have the tendency to throw back and revert to the type of the original parents from which they were produced, so variations in breeding must be expected. Special points in size, form, colour and laying or table qualities can be fixed in poultry only by continuous and careful selection and breeding for those points.

CHAPTER X.

ARTIFICIAL HATCHING AND REARING BY HAND.

HATCHING.—All poultry-keepers have at times been troubled with hens that were bad sitters. It is exceedingly provoking to have a setting of eggs spoiled ; also frequently when there are a number of good eggs which should be set it is difficult to procure a broody hen. All these annoyances are done away with by the incubator. Artificial incubation is no longer a mere theory. In these days it has reached a state of perfection that is almost astonishing. In these machines a large number of eggs can be hatched at any time and season of the year and almost as successfully as by hens.

In hatching by incubators it is of the utmost importance that the eggs be fresh ; they should not be more than three days old in the hot weather and seven days old in the cold season. If stale eggs are placed in the incubator, the probabilities are they will not hatch. Another thing to be guarded against is the proper regulation of the heat in the incubator. In the plains of India the heat should be only between 101°

and 103°; less will be ineffectual, and more will be injurious. It is needless for me to say much here about the method of working incubators. Different machines are differently constructed, and a book with all required directions about regulating and working the machine is given with each incubator. There are, however, a few hints that should be carefully borne in mind. First, care should be taken about proper and sufficient ventilation. The drawers should be opened twice a day and the eggs exposed the full length of time,—that is, at the beginning of incubation for ten minutes, and after the tenth day for twenty minutes or until the eggs are cool. Second, do not allow the light to smoke. Third, never allow the heat to rise above 103°; keep as close to 102° as possible. During July, August and September the heat will frequently rise very high. This is specially the case during the week or so before the chickens are due to hatch. Fourth, the machine, the egg-drawer and water tray must be kept scrupulously clean. After every hatch the egg-drawer, water tray and canvas must be properly washed with boiling water and Permanganate of Potash. Fifth, do not open the egg-drawer often during the time the chickens are breaking through the shells. They will become chilled.

One of the best machines of the kind is that known as Hearson's Champion Incubator, made by Chas.

Hearson & Co., Ltd., 235, Regent Street, London, W. Another splendid incubator is the Glevum. Having a glass front to the egg compartment, the eggs in it can be watched during the hatching time. This makes it very interesting.

REARING.—It is, doubtless, very provoking to have a setting of eggs spoiled, but it is even more annoying, when the chickens have been hatched and are strong and lively, to find some of them crushed to death by their clumsy mothers, and others dying for want of proper care from their mothers. Hence many attempts have been made to solve the problem of rearing by artificial means. Foster-mothers and Cold-brooders are the best contrivances to take the place of the mother hen, and, with proper care and cleanliness, they can be worked successfully in India. When chickens are hatched in an incubator, they must be removed from the machines as soon as they are dry. Some of the incubators have drying-boxes for chickens just hatched. When the chickens are hatched, they must be taken from the egg-drawer and put into the drying-box and kept there for from twelve to sixteen hours, when they must be removed to the foster-mother. Care must be taken that the drying-box and foster-mother are not too warm, and that there is sufficient ventilation. The heat must not be more than from 90°. No water must be kept in the machine, and there must be free circulation



B. Soc. Rose-Comité Barisins

of air through the machine. If the foster-mother is allowed to become too close and warm, the chickens will become ill and die. Only 12 chickens should be kept in India in machines made to hold 50 in England.

There is a simpler and cheaper method of rearing chickens by hand, which is better adapted to India, especially when the chickens are hatched from November to April. After the chickens are hatched, they must be allowed to remain with a hen for three or four days. The animal heat from the hen is very necessary for the chickens. If an incubator is used, the chickens should be kept in the drying-box for the first three days. The lid of the drying-box must be kept an inch or so open, in order to give plenty of ventilation. The chickens should be taken out of the drying-box and fed; after feeding them they should be again placed in the drying-box. They should be fed every two hours, and only a little given at a time. They must be fed as directed in the previous chapter. On the evening of the third day after they are hatched, the chickens will be strong enough to run about, and will be able to eat properly. They should now be taken from the hen or drying-box and placed in the box foster-mother described below.

The next morning the chickens must be taken out of the box foster-mother and placed on a clean plank under a small *tappa* or run, or in a large open box; some food should be thrown from a little above their

heads down on the plank. At first those taken from the hen may not eat, and will keep crying for their mother, but repeat throwing the food, and a few of the chickens will begin to pick up and eat the little pieces; and gradually the others will do the same. As soon as the little creatures stop picking and running about they must be put back into their box and kept quiet for two hours, when they must be taken out and fed again; after which they must be again put back. They will enjoy the warmth and go to sleep. This process must be repeated every two hours until the chickens are a week old. On dry sunny days they must be left out in the open on the dry green grass under a small run for two or three hours in the morning and evening. It is a good thing to put the chickens out on the dry green grass for an hour or half-hour from the second or third day they are hatched.

Chickens should never be placed out on a wet, stormy or windy day. If the sun be too hot for the chickens, a piece of canvas or mat should be thrown over half of the *tappa* or run. When the weather is unsettled, the chickens should be placed in a large box with the top open, in a warm corner in the shed; some clean sand or dry earth should be put in the box.

For the first three days a *tappa* or run two or three feet in diameter will be sufficient for a dozen chickens to run in. On the fourth day they will need a little more

room. After they are seven days old they must be placed in a proper run out on the green grass in the sun for three hours in the morning and three hours in the evening. A run, six feet long and three broad and two feet high, will be large enough for a dozen chickens. When six weeks old, they can be allowed perfect liberty in the open, but must have some person to watch them and guard them from crows and kites. Until they are eight weeks old chickens should be confined under a small run or in a box for two or three hours during the middle of the day ; this rest will do them much good.

BOX FOSTER-MOTHER.—For the first three days the chickens should be allowed to sleep under their mothers or in the drying-box of the incubator. Great care must be taken to allow sufficient ventilation in the drying-box. On the third night they should be put in a box made as follows :—Make a box two feet long, eighteen inches wide and eighteen inches high, cover the top with half-inch mesh wire-netting, put a door on one side of the box, made of a wood frame and half-inch mesh wire-netting ; to the wire-netting on the top of the box attach strips of flannel, the strips being two inches wide and hanging down to one inch of the bottom of the box ; place these strips two inches apart ; on the bottom of the box place one inch of clean coarse sand, and over this some soft dry cut straw on coarse saw-dust

$\frac{1}{2}$ inch deep. When the chickens are placed in this box, they will go in between the flannel strips and nestle there as they would under the hen's wings. When the night is cold throw a piece of cloth over the door and half of the top of the box. This box makes a capital foster-mother. It will be sufficiently large for two dozen chickens of a week old ; as the chickens grow larger, fewer of them must be kept together ; not more than six chickens, six weeks old, must be kept in a box of this size. The wire-netting on the top and the door at the side will give ample ventilation and the flannel will give all the warmth required.

When chickens are hatched under hens, they must be properly rubbed over with Keating's insect powder when they are twenty-four hours old, and again when they are removed from under their mother and before they are placed in the box foster-mother mentioned above. If lice are allowed to remain on chickens, they will not thrive. The box and the flannel must be washed with Phenyle or Jayes' fluid and water, and dried in the sun at least once a month, and the chickens occasionally rubbed with insect powder.

After the chickens are eight weeks old they should be kept in a large box-house on clean dry hay or sand. In calculating space for chickens above eight weeks old and under four months old, you must count two chickens as equal to one full-grown fowl.



BLACK ROSE-COMB BANTAM.

Fig. 47.

The chief difficulty in rearing chickens by hand is keeping them contented and happy. It is not difficult to feed them and give them warmth, but it needs a great deal of time and care to keep them from becoming restless and from piping. For the first week chickens brought up by hand give more trouble than those reared by a hen, but they soon get very tame and are easily managed. Only chickens of the same age and breed must be kept together.

If there are only a few chickens, and the hens be good mothers, it will not be wise to take them away from them. A hen can manage from 6 to 8 chickens very well in the cold weather, and from 8 to 16 in the hot weather. If there be more chickens than two or three hens can properly manage, it will be best to rear them all by hand. It will be less trouble and expense to rear a hundred chickens by hand than to look after half a dozen hens with their broods.

Overcrowding must be guarded against. If too many chickens are put in a box, or if the box is too close and warm, the chickens will become ill and die of roup or small-pox. Then, again, chills must be strictly guarded against. If the box is not sufficiently warm, the chickens will get chilled. The temperature in the box should be 90° for the first few days, and 80° later on.

CHAPTER XI.

MANAGEMENT OF LARGER CHICKENS, CAPONISING, MANURE, AND FATTENING FOWLS.

LARGER CHICKENS.—Inexperienced persons are very apt to make a great mistake in rearing chickens, by neglecting those between a month and eight months old for the younger brood. They think the birds are old enough to look after themselves, and do not require the same amount of care as the younger ones ; whereas the fact is, that the birds need more care when they are between a month and eight months old than they ever did or will, and any neglect at this period will be attended with serious results. At this time the down or nest feathers are being shed, and full-grown feathers take their place. This causes a continual drain upon the system, and the birds need greater warmth and extra nourishment, and require to be carefully guarded against exposure to cold and wet.

Chickens under eight months old must be fed four times a day, and allowed at each meal as much as they will eat ; generous feeding will produce good birds.

Wheat, barley-meal, oat-meal, oil-cake, paddy, gram, peas, green grass and some animal food are the best articles of food for young and growing fowls. Ground bones and white-ants should be regularly given.

Particular attention must be given to cleanliness of their boxes, house and run or yard. Dirty soil and filthy houses will soon kill the birds.

Instructions have already been given about the space needed for larger chickens, and also about giving them a bed of dry sand to sleep on.

It is very necessary to keep the cockerels and pullets in separate houses and yards. When the cockerels are three or four months old, they must be removed from among the hens and pullets and kept by themselves until they are 10 months or one year old.

Care should be taken to keep only cockerels of the same breed and age together. If birds of different sizes are kept in one pen, the older birds will ill-treat the younger ones and do them a great deal of damage. If cockerels under six months of age are put together at the same time in a pen and run, they will grow up together and live in peace. Game and Chittagong cockerels are more active and quarrelsome than cockerels of the other breeds, and must be kept separate or else they will ruin the other birds. They must not be crowded. Give them as much room in the house and run as you should give adult birds.

Cockerels are ready for the table when they are between four and six months old. It is advisable at this period to weed out all the defective birds--such as are very much mis-marked, and all such as have their tails, backs, beaks, legs, toes, wings and necks crooked, and all undersized and weakly ones. All these should be either killed or sold for the table. After this, select the best birds, and keep them separate for replenishing the breeding-stock. When the worst and the best have been separated, keep the rest by themselves for another two or four months, when you can go over them again and make your final selections, keeping those you want and selling the rest. Those selected for breeding must be treated with great care, and when twelve months old they must be mated with selected hens.

The pullets will be ready for the table when they are five or six months old, and should be weeded out in the same way as the cockerels. The inferior birds should be either sold or used for the table and those intended for the breeding pens must be kept in separate pens and properly treated. When they are between ten and twelve months of age, mate them with cocks that are at least a year older. The instructions given in the chapter on breeding must be faithfully adhered to.

CAPONISING.—Caponising is the taking away from cockerels the power of reproduction. By this means the weight of the birds and the tenderness of the flesh are

greatly increased. The operation should be performed in the cold weather, and when the bird is between four and six months old.

The following description is a translation of a French treatise :—

“The instrument employed in the operation should be very sharp; a surgeon’s small operating-knife, termed a curved-pointed bistoury, is far better than an ordinary knife, as it makes a much neater wound, and so increases greatly the chances of healing; or a curved pointed penknife may be used. A stout needle and waxed thread are also requisite; a small curved surgical needle will be found much more convenient in use than a common straight one.

“It is necessary that there should be two persons to perform the operation. The assistant places the bird on its right side on the knees of the person who is about to operate and who is seated in a chair of such a height as to make his thighs horizontal. The back of the bird is turned towards the operator, and the right leg and thigh held firmly along the body, the left being drawn back towards the tail, thus exposing the left flank, where the incision has to be made. After removing the feathers the skin is raised up, just behind the last rib, with the point of the needle, so as to avoid wounding the intestines, and an incision along the edge of the last rib is made into the cavity of the body, sufficiently large

to admit of the introduction of the finger. If any portion of the bowels escape from the wound, it must be carefully returned. The forefinger is then introduced into the cavity, and directed behind the intestines towards the back, somewhat to the left side of the middle line of the body.

“ If the proper position is gained (which is somewhat difficult to an inexperienced operator, especially if the cock is of full size), the finger comes into contact with the left testicle, which in a young bird of four months is rather larger than a full-sized horse-bean. It is moveable, and apt to slip under the finger, although adhering to the spine ; when felt, it is to be gently pulled away from its attachments with the finger and removed through the wound—an operation which requires considerable practice and facility to perform properly, as the testicle sometimes slips from under the finger before it is got out, and, gliding amongst the intestines, cannot be found again readily ; it may, however, remain in the body of the animal without much inconvenience although it is better removed, as its presence is apt to excite inflammation.

“ After removing the left testicle, the finger is again introduced, and the right one sought for and removed in a similar manner. It is readily discovered, as its situation is alongside of the former, a little to the right side of the body. Afterwards the lips of the wound are

brought together and kept in contact with two or three stitches with waxed thread. No attempt should be made to sew up the wound with a continuous seam, but each stitch should be perfectly separate and tied distinctly from the others.

“In making the stitches great care should be taken ; the skin should be raised up so as to avoid wounding the intestines with the needle, or including even the slightest portion of them in the thread—an accident that would almost inevitably be followed by the death of the bird.

“After the operation the bird had better be placed under a coop in a quiet situation, and supplied with drink and soft food, such as sopped bread. After a few hours it is best to give him his liberty, if he can be turned out in some quiet place removed from the poultry-yard, as, if attacked by the other cocks, the healing of the wound would be endangered.

“After the operation the bird should not be permitted to roost on a perch, as the exertion of leaping up would unquestionably injure the wound ; it should, therefore, at night be turned into a room where it is obliged to rest on the floor previously covered with some clean sand. For three or four days after the operation the bird should be fed on soft food, after that time it may be set at liberty, for a short period, until it has recovered entirely from the operation, when it should be put up to fatten.”

The natives of India are adepts at caponising. Any man who knows how to do it will perform the operation for a few pice.

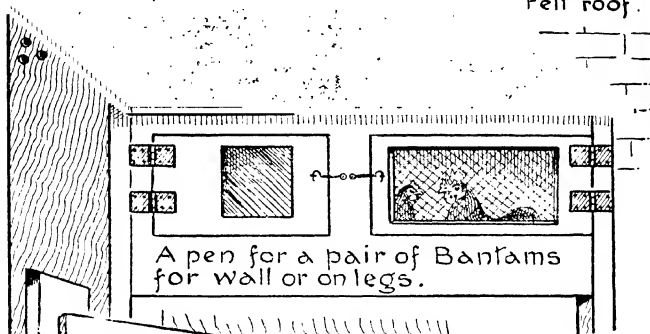
MANURE.—Fowl and duck manure is valuable for flower and fruit gardens, or any crop. It is too strong in its undiluted state, and must be thoroughly mixed with some fine dry earth before it is put on the ground. The manure should be collected in a pit or barrel, and kept some distance from the house.

FATTENING FOWLS.—Capons and young hens fatten the fastest. Growing chickens and old birds should not be put into the fattening-coop.

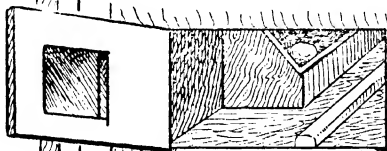
Only perfectly healthy and robust fowls should be selected. The birds selected must be kept each in a separate coop or compartment. These coops or compartments must be only fifteen to eighteen inches square and two feet deep—no larger. The top, sides and back of the coop must be boarded up; the front enclosed with wire-netting or with bars. The fowls in the different coops or compartments must not see each other. The coops should be kept in a room that can be closed and made dark after the birds have been fed. If kept in the open, a canvas screen should be drawn before the doors. The bottom of the coop should be barred, and have a drawer underneath to receive the droppings. The droppings must be removed twice a day. The coops should be constantly painted over

BANTAMS & BANTAM PENS.

Felt roof.



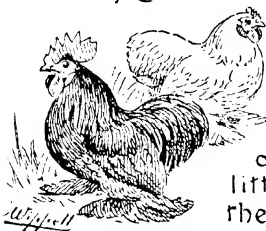
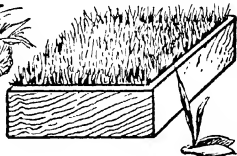
A pen for a pair of Bantams
for wall or on legs.



Showing
inside pen.
position of
nest box
& perch.

Legs
about 3 ft
long.

Bantams
that have
no grass run, should have
sods of grass, or boxes of sprouted oats.



If feathered
legged birds
are kept.
Use short
straw chaff
or peat moss, as
litter to preserve
the foot feathers.

Japanese are
splendid pets
for young
children.

with kerosene oil or Phenyle to keep them free from vermin.

The best food for fattening fowls is Indian corn-meal, barley-meal and boiled rice, and, occasionally, wheat-bran or the inner husk of the rice mixed with boiled potatoes, vegetables and butter-milk. The meal and brans should be boiled till quite stiff and dry, and allowed to cool. The food should be changed occasionally. The fowls must be fed four times a day, and as much given at a time as they will eat. A constant supply of water is necessary.

A properly fed large fowl should gain 1 to 2 lbs. a week, and should be ready for the table in two or three weeks. Fowls fatten quicker in the warm weather than in the cold. Sometimes a fowl refuses to put on fat, and becomes ill when subjected to the fattening process. When it is observed that a fowl has not gained weight during the first week, it is best to kill it as it is.

CHAPTER XII.

THE INFLUENCE OF CLIMATE ON DOMESTIC FOWLS.

ALLUSION has been made to some of the practical difficulties met with, in breeding fowls recently introduced from other countries. Experience and study have taught us that the question of acclimatization is one of the most important to poultry-breeders, although so often ignored. The following article from "Farm Poultry" is well worth studying:—

"The subject, as a whole, considered as it affects both human beings and domestic animals and plants, is but little understood. While it is quite universally recognized that changed conditions, especially changed climatic conditions, often have a decided influence for better or for worse on both plants and animals, the nature and extent of such influences have not been studied enough to make possible the formation of any general laws of acclimatization. Scientific men are confident that investigation and time will demonstrate the existence of such general laws; but at this date the mass of facts regarding the effects of climate and of change of climate on organic life though considerable

and most interesting, has furnished them only with hypotheses.

“It is a recognized fact among farmers and breeders that cattle and horses taken from one part of the country to the other require some time (the average perhaps being about a year) to become so habituated to the new conditions as to bear them easily, and that the systems of some animals never become reconciled to the change.

“Breeders and purchasers of the larger domestic animals, when buying stock, take this fact into consideration to a much greater extent than do breeders of poultry. So also do writers in the stock and agricultural journals. The subject of acclimatization is mentioned and discussed by them much more frequently than by poultry writers. It has been made *familiar* in connection with other stock.

“Naturalists tell us that every change, however slight, in its surroundings, affects in some way the constitution of an animal. The organism having become habituated to existence under certain conditions, any change in these conditions necessitates corresponding changes in the system of the animal. These changes are not always even temporarily injurious. Sometimes the change seems to have an invigorating effect on an individual or a race, and it thrives far better than in its native location. Sometimes the change stimulates to unwonted activity to be followed by enervation.

Sometimes it is injurious at first, but the prejudicial causes are soon overcome, and there is little apparent difference in vigour and fecundity between that part of a stock which remained in its native home and that introduced to a new environment. Sometimes the change is detrimental from the outset, and finally disastrous to the individuals subjected to it. These four classes are not separated by hard-and-fast lines. We pass from one to another by almost imperceptible gradations.

“Coming now to the practical application of the question as directly affecting poultry and poultry-breeders, I believe that if the importance of this question were more generally recognized, and the nature and extent of the hindrances Nature places in the way of transportation of fowls were better understood, there would be ninety per cent. less friction in the business than there is to-day.

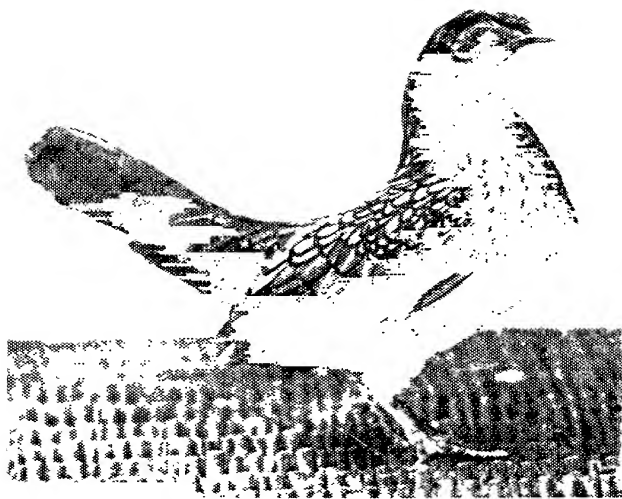
“Buyers and sellers of eggs and fowls ought to know that the change of conditions caused by transporting them even a short distance may mean the inauguration of constitutional changes, the exact nature and extent of which can only be conjectured, and which cannot by any known rule or method be controlled.

“We are not even able to select the individuals most likely to accommodate themselves to the change—because, so far as observation goes, there is absolutely

nothing to guide in such selection. The change which benefits one fowl injures another. Of the two fowls the one which best stands the change may be inferior in constitutional vigour. According to the best information obtainable, the ease with which acclimatization is effected depends not so much on stamina or strength, as on some peculiarity, some constitutional variation or tendency to variability which enables some individuals to conform readily to certain conditions, and to adapt themselves with comparative ease to any changes of conditions.

“The resemblance of two localities in general climatic features does not, it would seem, furnish any assurance that fowls from one are specially suited to the other. According to the best authorities, organisms are affected by the mere fact of change; no two places are exactly alike; though the differences in climate may be imperceptible to us, their operation soon reveals their existence, and then, as we have seen, the ease with which each individual becomes acclimatized depends less on the extent of the change and the nature of the new environment than on his own constitutional capacity for adapting himself to change—to changes of any kind.

“As to whether acclimatization may be more readily accomplished at certain periods of life than at others, we know nothing definite. Theoretical reasons might be given in favour of one period or another,



GOLD SEBRIGHT BANTAM.

Fig. 49.

and some facts adduced in support of all the theories. Some have supposed that acclimatization would be effected best by purchasing eggs; that chicks hatched in the new locality became acclimatized more speedily than would fowls subjected to the same change. I know of no instances that might be cited in support of this view, and am rather inclined to think the contrary true, though some of my experiences seem to indicate that when chicks are raised to maturity from travelled eggs, they become more completely acclimatized than they would if brought when at or near maturity. There can be no doubt that the chicks from travelled eggs must, after hatching, undergo precisely the same process of acclimatization as adult fowls. When we consider that the first few weeks of a chick's life are critical under the most favourable conditions, it is not at all surprising that there are so many complaints of poor chicks from travelled eggs. With this point in view, we see how unfair is any comparison between a man's home-bred stock and that which he has raised from purchased eggs, or hatched from imperfectly acclimatized stock.

“The recognition of the influence of change of climate furnishes an explanation of many of the disappointments in the quality of stock, even those bought from reputable breeders. It is well known that the tendency to reversion is strong in all thorough-bred

stock; but it is not so well known, though just as well ascertained, that a change of location strengthens this tendency. The reversion may be a general deterioration, or may be confined to a few particulars, possibly to only one. It may take the form of deterioration of plumage, or departure from typical shape, or impairment of vigour, or decrease in fertility. It may be general, affecting all the individuals subjected to the change, or special, affecting only a part of them. It may be accomplished so rapidly that it will be difficult to believe that fowls could change so much in so short a time; or so gradually as to escape notice for several generations. It may be permanent and irreparable, or temporary and be gradually eradicated as the stock becomes acclimatized. But that reversion does take place under changed conditions, has been shown so often in the case of other domestic animals that the breeder of fowls who finds his newly bought stock disappointing will do well to consider this point fully before condemning the strain, and accusing the seller of fraud.

“The aptitude for acclimatization depends on each individual fowl; the results of changes depend on conditions beyond our control. Whether any, or a part, or all of a flock may become acclimatized depends on how many of the flock possess the power of adapting themselves to the change. The only way in which it

can be found what birds possess a tendency to constitutional variation is by actual test—by submitting them to the change.

“Every buyer of fowls and eggs should keep these facts well before him when making a purchase, and make up his mind that the transaction, like marriage, is ‘for better or for worse.’ They may not be perceptibly affected by the change; it may benefit them; it may injure them. The results depend in part on matters beyond human control, and almost outside the realm of human knowledge.

“The time required for acclimatization varies in different individuals, and with the degree of variation necessary to an approximate acclimatization. Where a change is immediately beneficial, or does not appreciably affect the fowls either way, the element of time hardly needs consideration; but close observation will show, I think, that even after slight changes the first results in breeding are less satisfactory than those obtained later, and that it is always best to have fowls in their new home some little time before the breeding season. A few breeders see the importance of this point so clearly that they make a practice of mating their home-bred fowls, as well as others, some months previous to the breeding season.

“It will be found, however, that in a majority of cases changes are to some extent detrimental, and even

where no permanent deterioration results, a period varying from a few months to a year or more must elapse before fowls are, to all intents and purposes, the same as before the change. Some contend that a perfect acclimatization never does take place in the individuals first subjected to the change; that it can only be accomplished in their descendants, but practically we may say that fowls are acclimatized when their average fecundity reaches the point it did in the old habitat, and the offspring are not noticeably different from the average of their race. As a general rule, I think, it is not safe to breed from fowls which have been subjected to a radical change of climate until they have been in their new home twelve months.

“At one time I was of the opinion that the period required for acclimatization might be longer or shorter according to the season at which the removal took place. Such experiments as I have been able to make, fail to confirm this opinion. There are some changes which commonsense alone teaches us ought not to be made—as, for instance, the removal of fowls from a cool to a hot climate during the hottest season, or vice versa; or the removal of fowls immediately previous to, or during, the moult. Aside from such changes as these the season of the year seems to have little to do with either the nature of the process or the time required for its consummation.



HYDERABAD GAME HEN

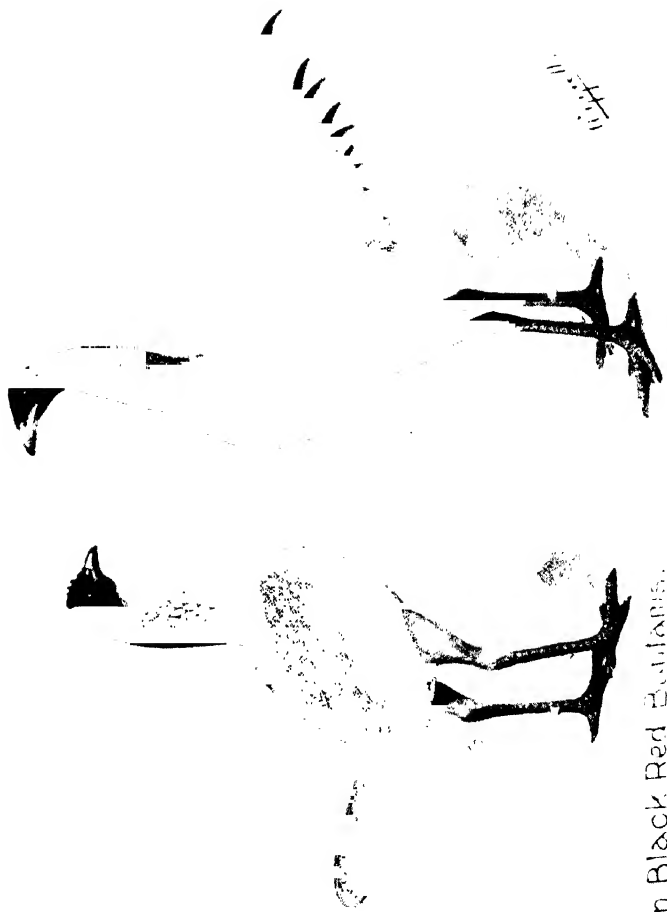
Fig 50

“It is reasonable to suppose that in removing fowls to a climate widely different from that to which they are habituated, it would be an advantage to accustom them to the change gradually. Yet, when we consider that we cannot estimate in advance the effects of a given change, we see how difficult it would be to regulate a gradation of changes intelligently.

“Just *how* climatic changes affect an animal, physiologists cannot tell us. The most pronounced effect is on the blood ; but they are still at a loss whether to say there is a reduction of formation of blood, or a too active destruction of blood. Perhaps both causes operate at the same time. The diseases commonly resulting from the change from a temperate to a tropical climate are anæmia, malaria fever, dysentery and liver complaint. Following the change from a hot to a cold climate, we find an increased liability to affections of the throat and lungs. Diseases of both kinds may be noticed as common in fowls which have been moved from one locality to another. It should be borne in mind that there are few localities where climatic conditions do not vary considerably. Local *changes in the weather* have the same relations to certain diseases as have changes in localities ; but in the case of removals the diseases occur in more aggravated forms than when they follow ordinary variations of temperature and humidity. Thus, a sudden fall in temperature may

prove fatal to an unacclimatized fowl by producing a malignant form of croup, bronchitis, or pneumonia, while the acclimatized fowl exposed to the same conditions escapes with a mild attack of 'sniffles.' In like manner the new arrival is seriously affected by extremes of heat and dampness which affect fowls reared in the locality only by causing them discomfort.

"It is not likely that there is any breed of domestic fowl incapable of becoming acclimatized in any locality where men can live, except possibly in polar regions. Some breeds may be more susceptible to change than others, and some may attain development only in certain districts; but in every breed enough individuals will be found able to propagate their race, with, perhaps, some modifications of form or colour, or with a diminution of size or prolificacy, in their new home. This is the phase of the question which concerns poultry-breeders most, and to which they should give most careful consideration. We need to study the subject in all its ramifications. While, as has been said, in the present state of knowledge of the influence of climate, results of changes cannot be anticipated and we leave much to chance, it may be that a better understanding of the subject will enable us to act with some degree of intelligence, at least to the extent of modifying the effects of changes. In any case it will be well to have what can be known on the subject a matter of common



Modern Black Red Butane.

knowledge. Every intending purchaser of stock or eggs should know that results may be disappointing through no fraud on the part of the breeder, and through no inherent defect or weakness in the stock that is not common to all fowls. If we cannot learn to overcome the effects of climatic changes, we must learn to allow for 'shrinkage' due to such changes, and to make the allowance without grumbling."

A number of people in India have imported fowls from Australia and their experience goes to prove that Australian birds do better in India than do the birds imported from England. The journey from Australia to India could be considerably shortened if arrangements were made for the birds to be sent via Colombo. If shipped to Colombo and from there by either train or steamer to the Indian port, the voyage would take only from 15 to 20 days instead of from 32 to 40 days as is usual, and the shorter journey will not be so harmful to the poultry.

CHAPTER XIII.

DISEASES OF POULTRY.

It is comparatively easy to prevent fowls from becoming ill, but once sickness gets in among them, it will be found extremely difficult, if not impossible, to effect a cure.

“Prevention is better than cure” is a motto especially applicable to fowls and their diseases. In most cases, the only thing to be done when serious disease takes hold of a fowl is to kill it and bury it deep under ground or burn to ashes and bury the ashes.

The most common causes of illness among poultry are dirt, damp, overcrowding, bad food and water, badly ventilated or draughty houses, vermin, and, very frequently, contagion. Lack of cleanliness is a prolific cause of disease. Fowls are certain to become ill if they are kept in a badly ventilated house or are overcrowded. Neither can they stand wet—they are unlike ducks. Water will soak right through their feathers and give them a chill.

When fowls have been purchased at an auction market, or from dealers, or have been bought from a

person the condition of whose poultry-yard you know nothing about, or when the birds have travelled, it is always safe to keep them separate from the other birds for at least a month. Birds that have travelled long distances in very close coops and hot railway waggons, or are exposed to draughts and wet on the journey, are liable to become over-heated or chilled and take ill. They must be kept separate for at least a month and be fed and watered separately, and the vessels used for them never used for the other birds. Frequently a bird brought into the poultry-yard will bring infection with it, and cause terrible havoc among the birds. Too great precaution cannot be taken in this matter. When a bird is brought into the yard, it should be closely examined ; examine its mouth and throat for canker and diphtheria, and the nostrils and head for roup, the legs for scurvy, and under the feathers for lice.

The first thing to do when a fowl becomes ill is to remove it from the rest, and place it in a small, dry, warm and properly ventilated house by itself. This will give the sick bird a chance to get better, and prevent the disease spreading through the yard. Sick poultry must be kept warm, fed properly and treated gently. The next thing to do is to find out and remove the cause or causes of the disease and give some preventive to the unaffected birds, and thus prevent all the other fowls

from becoming sick. The poultry-house and the place where the sick fowl is kept must be frequently disinfected with Carbolic powder, or Phenyle powder. You can make Phenyle powder by mixing eight ounces of pure Phenyle with three or four seers of clean sand or sifted ashes.

Let us divide the diseases of poultry into three classes : first, common and simple ailments ; second, serious but not infectious diseases ; and, third, infectious diseases. Most of the medicines prescribed are homœopathic, and can be obtained from any homœopathic dispensary. They are safe and efficacious.

1.—COMMON AND SIMPLE AILMENTS.

1. *Fledging*.—Chickens often droop and suffer much whilst their feathers are growing, especially in the cold and wet weather ; and the breeds which feather most rapidly suffer most ; getting the feathers too early rapidly weakens them and stunts their growth.

Keep them out of the wet and damp, and give them sufficient warmth. Clip the feathers of the wings and tail. Give some meat every other day, and a little chopped onions and garlic. Put a few drops of Parrish's Chemical Food in their drinking-water, or give a little Douglas' Mixture ; put a little Poultry Powder in the morning food ; give it only two or three times a week.

Dust frequently with Rough on Lice, or some other good insect powder.

2. *Moulting*.—Some fowls suffer very much during moulting. If care be not taken, they will be permanently injured if not die.

If kept separate and properly fed and housed, fowls very seldom suffer much during this period. Very fat birds suffer much during this period. Birds in moult should not be allowed to remain in the breeding pen, or cocks and hens to run together.

Protect the bird from damp, cold winds, and from intense heat.

If the bird is becoming thin and looks unwell, give oat-meal or wheat-meal mixed with milk in the morning and a little meat during the day. A small quantity of linseed meal given in the food twice a week will be beneficial. Give some Sulphur or the Poultry Powder and Douglas' Mixture twice a week. It will greatly help the older birds if the old feathers in the wings and tail and in the legs are gently pulled out. The birds should be kept free from lice and given plenty of green food, and, if possible, allowed free range or a large run.

3. *Loss of Feathers*.—Vermin and want of green food are the chief causes of fowls losing their feathers before moulting.

Rub the fowls with Rough on Lice ; give a liberal supply of green food ; provide a dust-bath ; and remove

the bird from among the other fowls, and keep it warm, well sheltered from damp and cold winds. Give Sulphur or the Poultry Powder in the food.

4. *Soft Eggs*.—Some hens lay soft-shelled eggs, that is, eggs with a skin only. This is caused by want of sufficient lime or by overfeeding. It is also sometimes caused from the bird being driven about and frightened, or from the bird being troubled with vermin.

Remove the causes. Supply lime; reduce food; keep free from vermin; and treat the bird gently.

5. *Scaly Legs*.—Sometimes fowls are greatly troubled with this. It is caused by an insect under the scales of the legs. It is infectious.

Bathe the legs every morning for three days with kerosene oil or a strong solution of Phenyle and water taking care not to burn the tender skin under the feathers, or else wash with soap and warm water and rub on some Zam Buk or Embrocation. The Poultry Powder or Sulphur will do good.

6. *Soft Crop*.—The crop is enlarged and soft as if filled with water; when pressed, most offensive water is discharged. This is caused by obstruction of the food passage or by indigestion. If any obstruction, remove the cause; if by indigestion, give a small teaspoonful of Epsom Salts, after this give Condyl's Fluid, five drops three times a day in a dram of water, and some Tonic Mixture once a day for a week, supply grit. Add

charcoal to the food, or give it in pills. Stop soft food for a time and feed only on whole wheat.

7. *Feather-eating*.—Some fowls are greatly addicted to eating feathers. If they do not find them lying about, they will pull them off the other fowls. Rub some Asafœtida, kerosene oil or Elliman's Embrocation on the feather of the neck or part of the body from which the feathers are plucked.

It is caused from want of sufficient iron and animal food. Give a little Sulphur and Salt or Poultry Powder in the food, and Douglas' Mixture in the water.

Give all food in the scratching litter to keep the fowls busy. Also, add a little linseed to the grain feed.

If the hard horny parts of the beak are pared with a sharp knife, the bird will find it difficult to pull feathers. Feather-eating is sometimes a vice, and nothing will cure the bird of it. The best thing in such a case is to kill the bird.

8. *Egg-eating*.—Some fowls eat eggs, and will devour all they can find in the laying-house or sitting-nests.

Want of lime and gravel or worms and insects in the fields are the chief causes. Supply these and give the bird her liberty. If this will not cure her, a number of eggs should be emptied of their contents and filled with a paste made of the eggs mixed with strong mustard and Phenyle. The hot mustard and Phenyle will teach the bird a lesson, and she will leave the eggs alone.

Another plan is to leave a number of China eggs lying about the house and run. The hen soon gets tired of pecking at these and learns to leave them alone. If this will not cure her, she must be killed. Cocks as well as hens are given to eating eggs; and if one fowl does it, others will learn to do it also.

9. *Pale Yolks*.—The eggs of some breeds are naturally of a pale colour; but sometimes eggs have an unnatural paleness, which is a proof of weakness. Birds kept in confined runs and insufficiently supplied with green food produce pale yolks.

Give the hen a large run and abundance of green food; also some of the Poultry Powder or Tonic Mixture.

2.—SERIOUS BUT NOT INFECTIOUS DISEASES.

1. *Apoplexy*.—This disease is generally caused by overfeeding, exposure to the heat and close confinement. Langshans, Brahmas, Orpingtons and Rocks are very subject to apoplexy. They seem to suffer more than the other breeds from the effects of the heat. The attack is sudden and generally fatal. During the hot weather, and in the rains, hens in their nests in the act of laying are frequently attacked. Sometimes excitement will bring it on. Sometimes cocks and hens will get to fighting, and this will cause apoplexy. If the bird be not dead when noticed, it should be immediately

bled by cutting the vein nearest the bone under one of its wings, and cold water should be poured from a little height upon its head. If the fowl recovers partially, give it Belladonna 1x, one drop in a teaspoonful of water three times a day for two or three days, and feed it sparingly on soft food for a week.

Sometimes signs of an approaching attack can be observed—the bird having a staggering, unsteady gait, as if intoxicated. In such a case it must at once have its head bathed in cold water, and be removed to a cool quiet place. Give it a teaspoonful of Epsom Salts, and after that two drops of Belladonna four times a day. During the hot weather put a tablespoonful of Epsom Salts to a quart of the drinking-water.

2. *Bumble-foot*.—Large fowls are especially subject to this ailment. It consists, as its name implies, of a gathering at the bottom of the foot. Paint the part affected with lunar caustic or Tincture of Iodine, or, if the foot is very bad, apply linseed poultices to it daily until the gathering is ripe, then lance it with a sharp knife, and take out all the matter. Sometimes a hard core will be found in it. The patient should not be allowed to roost on the perch at night, but should be bedded on straw till the foot is quite healed. The wound should be properly washed with Phenyle and water, and the poultice should be continued for a few days after the lancing; a little Vaseline and Iodoform,

Zam Buk or Elliman's Embrocation applied to the spot and the foot bound up with a bandage will soon cure it. The bird should be kept in confinement until the wound has healed.

Bumble-foot is often caused by rough stony ground, or by heavy birds jumping from roosts that are too high for them. Correct the cause and the trouble will cease.

3. *Cramps*.—Cramps are brought on by exposure to wet or keeping the bird in a damp or cold place.

Boil *neem* leaves in water, add some salt, and rub the legs with it. Elliman's Embrocation is very good. Give warm and nourishing food, and keep the bird in a dry, warm and sunny room on straw. Give internally *Rhus Tox.* 1x and *Bry. Alb.* 1x alternately, one drop twice a day, or else give the Tonic Mixture. Do not give rice, but feed on barley, wheat and oats.

4. *Crop-bound*.—It is no uncommon thing for the crops of fowls to become so full of food or of some other substance that they cannot assimilate it. The consequence is that the fowl is unable to swallow anything, and naturally it pines away. The causes of crop-binding are various. It may be caused by the bird swallowing a piece of leather, paper, bone or matted grass. It manages to get this as far as its crop, but there the thing sticks, and refuses to go any further, blocking up the passage to the stomach, and finally preventing the bird from swallowing anything else.

Again, a fowl will at times gorge itself with a quantity of dry food, until its crop becomes unduly distended. Then the bird goes and has a drink ; this causes the food to swell, the crop becomes yet more distended and loses its power of elasticity. In order to cure the bird, its crop must be emptied. To do this, first pour a little warm water down its throat, and gently knead the crop with the hand for a few minutes. Leave the bird for about an hour, and then repeat the operation, this time pouring a little olive oil down its throat. If this does not do any good, take the bird between the knees, with its head downwards, and try to force the food in the crop out into the mouth by gently pressing the crop downwards.

If all these measures fail to have any effect after they have been repeatedly tried, it will be necessary, as a last resort, to cut the crop open and empty it. This should only be done in extreme cases, when everything else has failed.

There should be two persons to perform the operation, the operator and his assistant. Let the assistant take the bird in his lap, and keep it quite still by holding the base of the two wings with one hand, and the legs with the other. The operator will require a very sharp knife, a small article such as a small scoop or a small mustard spoon with which to empty the crop, needle and some thread for sewing it up. All the instruments,

and also the hands of the operator, must be dipped in diluted Jeyes' Perfect Purifier, Izal or Carbolic lotion. First make a straight cut in the upper part of the crop, about an inch in length, and then make a cut in the inner part and take out all the contents of the crop through it. Wash the crop with Condyl's Fluid and warm water, and sew it up again. The thread used for the sewing should be either horse-hair or catgut, not any vegetable substance, and the two skins must be sewn separately. Apply Zam Buk or Elliman's Embrocation to the wound. After the operation the bird should be fed very sparingly on soft food only and for the first day it should not have any water. It must not be allowed to have any whole grain for at least a week afterwards. Give some Poultry Powder or Tonic Mixture.

5. *Egg-bound*.—Hens are sometimes unable to pass their eggs. This is caused by the eggs being too large, the hen being too fat, or inflammation of the egg-producing organs. If not relieved, the bird will die.

The bird will go more than once to the nest, sit there some time, and then rush about to find another place. She will become mopish, and then unable to move. She will die in a day or two, or may linger on for a few days.

Apply some vaseline up the vent by means of a syringe or feather, and hold the bird over a pot of hot

water and let the steam envelope her vent. Give a teaspoonful of Epsom Salts, and a drop of Aconite to the bird, and keep on low diet. Some persons can bring away the egg with the hand, but this operation needs very great care, as the bird may be permanently injured. Sometimes the egg will break inside and pass out.

6. *Inflammation of the Brain*.—This is an incurable disease, so is also vertigo. Destroy the bird.

7. *Leg weakness*.—This complaint is usually found among young cocks of the larger breeds, and is caused either by wrong feeding, too rapid growth, damp, excessive heat, too much confinement, cold, damp floor or breeding from immature or weakly parents.

Give plenty of animal food, and some Phosphate of Lime every day. Give Parrish's Chemical Food in small doses, or some Tonic Mixture. Rub with Elliman's Embrocation, or paint with Tincture of Iodine. Give as much exercise and liberty as possible.

8. *Paralysis*.—This is incurable ; it is best to destroy the bird.

9. *Rheumatism*.—This disease is very much like cramps, except that it is accompanied with swelling of the joint and great tenderness. The same treatment as for cramps is effective.

10. *Vermin*.—This cannot be called a disease, but frequently leads to it by causing disquietude and want

of rest. In India, fowls are greatly troubled with these pests, much more so than in England, especially during the rains. Lice, bugs, ticks and fleas may be included in this category. It causes hens to break their eggs and leave their nests, and fowls to desert their roosts at night, during which time they cannot rest. Prevention is better than any cure in this case by keeping the poultry-house and the run clean. Apply some kerosene oil and tar to the inside of the house, coops, nests and perches; lime-wash the outside of the house, but put some Phenyle in the lime, or wipe with a mixture of kerosene oil and tar thoroughly. Sprinkle Carbolic Powder or Phenyle Powder on the fowl-house floor, or wipe the floor with kerosene oil.

Lice are a terrible but unavoidable plague, which you must fight against constantly. Chickens just hatched from under the hen are sometimes covered with lice on the head and neck; sprinkle the little creatures with Keating's insect powder, then wait for an hour or two, and rub Keating's insect powder on the affected parts very gently, and after a little while the disgusting parasites will try to make their escape by coming to the surface of the soft fluff of the chick instead of sticking on the skin and tormenting the poor little bird. The lice seem half intoxicated from the effects of the powder and are then easily removed. Still, they do not die and ought to be burnt or dropped into a strong solution

of Phenyle or kerosene oil and tar. This should be repeated once a week. Rough on Lice is more effectual, but it also affects the chickens, which droop for a while, and though I have never seen any die of the effects of the powder or be any the worse for it after a little time, still I should say Keating's powder was much the safest to use for little chickens. The mother hen must also be properly rubbed over with Rough on Lice. After rubbing her, keep her separate from the chickens for an hour so as to allow her to shake off the lice and powder that are on her. In the chapter on Recipés will be found some reliable remedies for lice.

After about a week the process of rubbing heads and necks of chickens must be repeated. When half-fledged, the birds seem to have a period of rest from their enemy, but still they must be looked to, and if any traces of lice are found, apply some Rough on Lice. There are four different kinds of lice and fleas that trouble fowls. The house bug also is very injurious to fowls. They live in the coops, perches, nests, walls and floors. The only way to get rid of bugs is to close up all the doors and air passages of the fowl-house and burn plenty of sulphur in it and keep the fumes in the house for six hours. After that, the house, floors, doors, boxes, nests and everything in the house must be thoroughly washed with strong Phenyle and water and then painted with a solution of kerosene oil and tar.

This must be repeated frequently. Unless the birds and the house and coops are thoroughly freed from vermin, the birds will die. As mentioned before, chickens from the incubator have the great advantage of keeping free of lice, at any rate till they have had time to grow strong. Many young broods droop and die off, simply on account of lice and bugs, nobody suspecting the pretty little chicks to be so tormented and gradually killed by those small but formidable enemies.

For grown-up fowls, use cocoanut oil six parts, oil of Eucalyptus one part and kerosene two parts as a cure for lice, but it ought not to be necessary to use this remedy, except during the rains and, perhaps, when moving a hen from her nest. It must never be used for sitting hens, as the powerful kerosene kills the chicks in the eggs. Great care must be taken to see that the oils are thoroughly mixed before applying otherwise the kerosene oil will greatly injure the birds.

Another very good remedy for lice on fowls is oil of Eucalyptus one ounce, spirits of Camphor one ounce, properly mixed with six ounces of cocoanut oil, and applied to every part of the bird where lice remain. Instead of the above the following may be used with good results :—

Spirits of turpentine	..	..	three chittacks.
Camphor	..	..	one chittack.
Cocoanut oil	..	..	twelve chittacks.

Apply only a few drops to each part. At the same time the coops, nests and all the wood and bamboo work must be thoroughly rubbed with kerosene oil seven parts and coal-tar one part, well mixed together. This should be done once a week.

The most effective lice powder known, is made as follows :—

Three parts of gasoline (Petrol) and one part of crude carbolic acid, 90—95 per cent. strength, or if the latter is not obtainable, take three parts of gasoline and one part of cresol.

Mix these together and add, gradually, while stirring, enough plaster-of-paris to take up all the moisture. It will take about four quarts of plaster-of-paris, to one quart of the liquid. The exact amount, however, must be determined by the condition of the powder. The liquid and dry plaster must be thoroughly mixed and stirred, until the liquid is evenly distributed through the mass of plaster. If correctly mixed the result should be a dry pinkish-brown powder.

Work the powder into the feathers of the infected birds, especially under the body and wings, and around the vent. A minute or two later, the dead and dying lice can be shaken on to a piece of paper, and burnt.

The powder has a slightly numbing effect on the hands of the operator. It is very poisonous, and should never be used for animals that lick themselves.

Ticks are very troublesome in some parts of the country, and are more difficult to get rid of than lice. The ticks get under the feathers of the poor birds, and burrow under the skin and soon kill the birds. On close examination you will find the corners and crevices of the coops and houses crowded with the vermin. It is a case of kill or cure. Pick off all the ticks you can find on the birds and rub the birds with Cocoanut oil twelve parts, Turpentine one part, Camphor one part, Phenyle one part and Eucalyptus oil one part. Treat the house coops, etc., in the same way as for bugs.

11. *White Comb*.—White comb and black rot of the comb are both troublesome diseases, and frequently the affected birds die. The disease is caused from bad feeding and want of cleanliness. Give from half to one teaspoonful of Epsom Salts in a little warm water. Wash the affected parts with Phenyle and water.

Make an ointment of the following:—

Camphor	..	..	.. one part.
Phenyle	..	..	.. one part.
Turpentine	..	..	.. two parts.
Cocoanut oil	..	..	.. four parts.
Sulphur	..	..	.. four parts.
Boracic Acid Powder	..	..	.. four parts.

Rub the affected parts with the ointment.

Zam Buk is also very good.

Give plenty of green food, and feed on soft food for a time.

Give *Arsenicum Alb.* 1x, one-drop doses three times a day internally. Or give the Tonic Mixture.

12. *Wounds*.—Wounds ought never to be neglected. Dress with a solution of Permanganate of Potash or Phenyle and water. Apply some ground turmeric or equal parts of ground sulphur and Boracic Acid Powder mixed together.

A broken leg can be set if taken in hand at once, and a plaster-of-paris jacket made over the leg with powdered plaster and water, the fowl being held fast till the plaster becomes hard. If this cannot be done, the broken limb must be put up in splints. The bird must be kept confined in a quiet corner for a few days.

13. *Seep*.—This is really consumption, and is incurable. The fowl eats, but is listless and grows thin. There may not be any sign of cold. Try cod-liver oil. The best thing to do is to kill and bury the bird.

14. *Swelling of the oil gland* above the tail. Do not press or cut it. Take a stick of turmeric, hold the end over a fire. Press the burnt part over the swelling; do this three or four times, after that apply some ground turmeric. If matter has formed, then it is necessary to cut the gland and remove the pus and wash it with Phenyle and water and apply ground turmeric or Boracic and sulphur.

3.—CONTAGIOUS DISEASES.

1. *Chicken-pox*.—This is really small-pox in fowls. Chicken-pox is often mistaken for roup. There may be a slight cold in the bird at the beginning, and the bird may appear to be dull and refuse its food ; but, generally, the disease shows no premonitory symptoms. Sometimes the bird has chicken-pox and roup at the same time.

It is caused generally by contagion, and is very infectious. Probably the infection is carried by flies or mosquitoes as it is difficult to account for the disease spreading as it does.

Servants may also bring the disease from near-by villages, by carrying half-dried scabs on the soles of their feet or shoes.

Symptoms.—A pustular eruption appears on the face, under the wings, and, in some cases, on the feet of the bird. Its first appearance is much like patches of dried blood on comb, face, or wattles as if the bird had been pecked and the blood had dried. The vesicles are pointed in the centre, and about the second or third day are filled with a watery fluid. Frequently the vesicles enlarge and run into one another. The eyes and mouth become affected ; the bird becomes blind and is unable to eat, or the feet become so bad that the bird is unable to walk. For the first day or two the bird shows very little signs of constitutional disturbance ;

but the fever and inflammation may gradually increase until the bird becomes very weak and is unable to move and dies in a few days.

In mild cases the pustules dry up and fall off in three or four days, and the fowl is soon quite well again. If properly treated, the bird will recover even though the disease be of a severe form.

Treatment.—This disease must never be neglected. The secret of success is to commence treatment immediately the first signs of the disease appear.

Separate the sick bird from the other poultry, keep it in a dry, cool and properly ventilated room free from draughts and a good distance from the other poultry. Give each bird from $\frac{1}{4}$ to 1 teaspoonful of Epsom Salts, to which add one drop of Tincture of Aconite. Feed on soft food, such as boiled rice, bread-crumbs and milk barley-meal, ground wheat and milk; give it as much water as it will drink, but put a teaspoonful of cream of tartar in a pint of water and place this in a clean earthen vessel near the fowl, so that she may drink at pleasure. Wipe the face and the legs with a cloth dipped in a strong lotion of Condyl's Fluid or Permanganate of Potash and water, and apply some ground turmeric and *neem* leaves to the affected parts. Another good remedy for external application is the juice of the leaf of the *Bhangrya* plant. This plant is known to a great many natives. Some people have rubbed the affected

parts with the juice of unripe tomatoes with good results.

Give internally the following native medicine which has been found to be very efficacious :—

Root of the *Chircheri* or *Chorchora* plant, four tolahs.

Root and leaves of the *Jokha* or *Joga Bailta* plant, four tolahs.

Thorn of the *Shimul* cotton tree, four tolahs.

The whole to be thoroughly ground and mixed together. Give of this five grains to each fowl three times a day. Or give five drops of Spirits of Camphor once a day.

Homœopathic Treatment.—Give *Rhus Tox.* 1x, *Pulsatilla* 1x, and *Aconite* 1x, alternately, one drop in half a teaspoonful of water every two hours until recovery.

The unaffected birds should be given these medicines also as a preventative.

Another proved remedy is as follows :—

Paint all the ulcers with citrine ointment, daily, until they dry down to a black scab. This will probably be in three or four days. Lift off the scabs carefully with a fairly sharp instrument. The little white roots of the disease will be found adhering to them. Collect and burn these. Wash the bird's comb and affected parts with a fairly strong solution of Permanganate of Potash.

At the same time the bird should be dosed with the following :—

Wheat flour	..	..	1 tablespoonful.
Flowers of sulphur	..	..	1 „
Cayenne pepper	..	..	20 grains.
Fowler's solution of arsenic	..	..	25 minims.
Cream	..	..	a sufficient quantity.

Mix well together and make into 20 pills. Give each affected bird one pill in the morning for four mornings. If the sulphur acts too powerfully on the bowels give boiled milk to drink. During treatment, feed on boiled onions mashed with oatmeal and boiled rice.

For chickens the above dose must be divided according to the size of the chick. Small chickens do not often recover from chicken-pox and are better destroyed.

2. *Cholera*.—Poultry-yards to-day are plagued with more than one disease that was altogether unknown to our grandfathers, and the most dreaded of these is undoubtedly chicken cholera. It makes its appearance in a yard often, no one knows how, and in a few weeks destroys the greater number of the birds. Preventive measures often seem absolutely useless, and in spite of everything that he can do, the owner sees his best birds carried off, one after another. This disease was for some time known to us only by the reports of the

damage it was doing in the yards of breeders in America and on the Continent, but every year it seems to be becoming more and more common among us.

The usual causes of cholera are lack of stamina in the birds, overcrowding, uncleanness, lack of green food and absence of shelter from the rays of the hot sun. Drinking stale, tepid water and eating decayed vegetable matter are also frequently to blame for its origin. There can be no doubt but that it is highly contagious, and one sick bird will pass the disease on to a whole yard.

When a bird is first attacked, it loses its appetite, looks thoroughly out of condition, its feathers are ruffled, and its eyes sunken and lacking lustre. What food it does take it seems unable to assimilate, but it eagerly consumes a large amount of water. It has diarrhœa, and at first the excrement is green and slimy, but afterwards it becomes whitish and frothy, and sometimes specks of blood are found in it. The bird becomes more and more sleepy and disinclined for exertion, and at last it sinks down and dies. Occasionally convulsions immediately precede death.

Practically there is no cure for this disease, for it runs its course so rapidly, and affects the intestines so much, that before any measures can have time to take effect the bird is dead. The fowl usually dies within twelve hours after the symptoms appear, though

sometimes it lingers for several days. Post-mortem examinations show the liver to be swollen, congested with dark blood, and in such a state as not to bear handling; the spleen also is swollen, the intestines inflamed, and various other parts of the body affected.

If fowls are kept on fresh ground, are not overcrowded and are properly cared for, there is not much fear of their being attacked. Should a bird become ill, strict repressive measures must at once be taken. Every fowl in the slightest degree affected must immediately be destroyed and burned or put right away from the others. The water which the healthy birds drink should have a small piece of camphor placed in it. All the excrement must be gathered up, and the house and run have quicklime, or some Phenyle scattered over them. The inside of the house should be cleaned with special care, and the walls and various appliances washed with fresh quicklime and water, in which is mixed Carbolic or Sulphuric acid or some Phenyle.

Whatever is done towards attempting to cure the sick bird must be done on the first appearance of the disease, for in a few hours it makes such progress as to render successful treatment impossible.

When the disease first appears, give the bird Veratrum Album 1x and Arsenicum Iod. 3x or Aconite Nap. 1x alternately every half hour or fifteen minutes; give one drop in a teaspoonful of water for a dose.

If the above remedies are not at hand, then give a teaspoonful of pure olive oil and five drops of Tincture of Camphor every two hours, or else 5 drops of Perry Davis's Pain Killer in a teaspoonful of water four times a day.

Feed the bird on arrowroot balls mixed with cold water. Only half a teaspoonful at a time must be given every three hours.

Great care must be taken not to spread the complaint by going immediately from the sick fowl to the healthy stock, or by carrying anything from the one to the other. When the bird dies, its body should be buried deep under ground, or burned.

Unless the bird is a very valuable one, the best thing to do is to kill it, and bury or burn it immediately it is attacked with the disease. It must always be borne in mind that this disease is communicable from the fowl to human beings. A strong solution of Phenyle and water should be used in the house and coop. Put Douglas' Mixture in the drinking water of all the fowls.

Give all the unaffected fowls 3 drops of Perry Davis's Pain Killer in a teaspoonful of water or else 5 drops of Tincture of Camphor in a teaspoonful of olive oil once a day for three days.

3. *Cold*.—This complaint is indicated by the same symptoms as we find in human beings, namely, a running

at the nostrils, and a slight swelling of the eyes. It arises from cold or exposure, and, if not attended to, may develop into roup or consumption. A person suffering from cold and cough or influenza must not be allowed to go into the fowls' run or house. Fowls take the infection from human beings. For cure, the bird should be kept in a warm place, and have one drop of homœopathic tincture of Aconite 1x and Arsenicum Alb. 1x, alternately four times a day—add ten drops of glycerine; or else give one grain Quinine and three drops of Sulp. acid dil. twice a day. Give nutritious food, rather stimulating in its nature. The Indians give a tablespoonful of pure mustard oil and a quarter teaspoonful of ground chillies. Inject a little Condyl's Fluid through the nostrils. Put a little glycerine and camphor in the drinking water of the fowls that are not affected.

4. *Diarrhœa*.--Diarrhœa is caused by bad feeding and dirty water, want of cleanliness, exposure to wet or excessive heat, indigestion. If not attended to, diarrhœa will turn to cholera.

Give the birds a tablespoonful of olive oil or a teaspoonful of Epsom Salts, and give Ipecac 1x, two drops in a teaspoonful of water every two hours, and then give Ars. Alb. 1x one drop in a little water every two hours or a dose of Tonic Mixture twice a day; keep the bird in a quiet corner, and feed on arrowroot mixed

into balls with cold water. Three drops of Perry Davis's Pain Killer in a dessertspoonful of water three times a day will do good.

5. *Dysentery*.—This is brought on from the same causes as diarrhoea.

Give a tablespoonful of olive oil or a teaspoonful of Epsom Salts, and also Ipecac 1x two drops in a little water every two hours for a day ; and then give Mercurious Cor. 3x one drop in a little water every two hours. Feed on arrowroot, also give a little *bael* fruit. Keep the fowl quiet and away from the others.

6. *Liver Disease*.—When any valuable fowl is seen to be pale about the face and shrunken about the comb, it should be handled at once to see if there is corresponding wasting away, for this generally denotes tubercular disease of the liver, a complaint that will not only inevitably prove fatal, but is also highly contagious. Occasionally a bird may be found to be going light without the symptoms of liver complaint, and this may be due to pulmonary disease, though there would be a cough to indicate complaint of the lungs. There is no cure for this. Ordinary cases of birds going light after a hard season of laying may be cured with cod-liver oil.

7. *Gapes*.—This disease is chiefly confined to chickens, and is due to the presence of small worms in the windpipe. These obstruct the air passage, so that

the bird has continually to open its mouth and gape in the effort to breathe, hence the name of the disease.

There are numerous methods of treating gapes. One common way is to take a feather, strip all the down off it except a little at the point, dip this point in turpentine and camphor, place it down the windpipe of the chicken, and after giving it a twist or two round, pull it out. The worms are often thus extracted with the feather. This plan, however, requires care, or else the chicken may be choked. In very mild cases it may be sufficient to place a little Camphor or a small quantity of Turpentine or Condy's Fluid or Permanganate of Potash in the drinking water. Another, and a very effective cure, is to cause the chickens to inhale the fumes of Carbolic acid. When the acid is heated it gives off a quantity of fumes. Hold the head of the bird among the fumes so that it inhales them, taking care at the same time that they are not sufficiently dense to suffocate it. This will very likely require repeating two or three times in order to thoroughly destroy the gape-worms. Or else mix one drop of Turpentine, one drop of Eucalyptus oil and one drop of Tincture of Camphor with six drops of mustard oil and pour gently down the chicken's throat. I have sometimes put a couple of drops of Spirits of Camphor on a small piece of bread and put it down the bird's throat. Repeat this twice a day for three days. Try three or five drops

of Little's Soluble Phenyle in a teaspoonful of water and gently pour it down the bird's throat. It is well to dust the chicken-house and run with fresh lime or strong Phenyle Powder after a case of gapes has appeared there.

The disease is epidemic, and is generally caused by foul water, exposure to wet or by decayed food. The sick birds must be separated from the others.

A piece of camphor, kept continually in the drinking water, acts as a preventive.

8. *Scurfy Face and Comb*.—This disease is caused by fungoid growth of insects, and is contagious. Apply the following lotion :—

Eucalyptus Oil	..	..	one part.
Spirits of Camphor	..	..	one „
Phenyle	..	..	one „
Turpentine	..	..	two parts.
Cocoanut Oil	..	..	four „
Flowers of Sulphur	..	..	four „
Boracic Powder	..	..	four „

Wash the parts with Phenyle or Izal and water and apply the lotion twice a day. Zam Buk also is very good but is rather expensive. Painting the affected part with Tincture of Iodine will often arrest the disease. Indians apply ground raw turmeric and *neem* leaves with good results.

Give the bird Ars. Alb. 1x twice a day, one drop in a little water, and feed on simple nourishing food. Give Poultry Powder or Tonic Mixture.

Another remedy that has been proved successful is as follows :—

Wash the bird's comb with warm soapy water and rub in gently a sufficient quantity of Red Oxide of Mercury Ointment 1 in 8.

Leave for three or four days, then wash off. A little vinegar should be rubbed over the comb after it has been dried.

If very bad, a second application of the ointment may be necessary. Take care that none touches the bird's eyes.

9. *Roup*.—Roup is the disease most to be dreaded for poultry. It is highly contagious, and at the very first symptom the affected fowl ought to be separated from the rest put in a warm place and fed on meal mixed with hot milk. Roup begins with a common cold, a clear discharge comes from the nostrils, and the eyes look watery ; this discharge soon becomes frothy, often very offensive, the nostrils become partially or entirely closed, hence a difficulty in breathing ; in some cases the eyes, and often the whole face, swell very much. Roup is, as distinguished from other diseases about the head, an epidemic disorder, having its starting point in the soft lining membrane of the beak. From this it may extend in all directions—to the external skin, or down the throat, or into the eyes, perhaps through the tear-duct. The constitution is

severely affected by it; and although it often comes from the neglecting of a common cold, it may, and very frequently does, cause death.

Symptoms of Roup.—It may come on suddenly, or slowly, with previous signs of general debility, moping, etc. The first signs are those of catarrh or cold in the head; dry cough or dull wheezing. There is fever and the fowl drinks eagerly. The comb and wattles may be pale or dark coloured. The cold grows worse. There is a yellowish or bloody discharge, thin and watery at first, which grows thicker and thicker, and fills, in severe cases, throat, nostrils and eyes, the latter being closed and swollen even to the size of a walnut, and the sides of the face may swell up. Pustules form all about the head and in the gullet, and discharge a frothy matter. The crop is generally swollen, though not always. The blind fowl cannot see to eat or drink, and hence is said to lose her appetite, although a most ravenous appetite is sometimes displayed. The discharge has a bad odour, and this is one of the chief signs of the presence of the disorder. Death may ensue from several causes, from starvation, the fowl not being able to eat; from suffocation, the thick matter clogging up the air passage; or from simple debility, as in so many other disorders.

The matter may pass through the bowels, and thus simulate diarrhœa; but this happens only in severe cases, and should not mislead the observer. A

symptom, of which there is no satisfactory explanation, is loss of some of the joints of the toes, after inflammation resembling dry gangrene in the human subject.

The list of symptoms will explain the various names which have been applied to it, viz., swelled eyes, diphtheria, sore head, bronchitis, asthma, canker, influenza, sore throat, etc., but some of these conditions may exist even when roup is not present. One of the best means of detecting the approach of roup is to lift the wing of the suspected bird and see if there is not a spot where the feathers are smeared with a discharge from the beak, which has rubbed off when the bird has put its head under its wing at night. Also, invariably look at the nostrils, and see if they are clean and free from the slightest clogging. Go the rounds at night with a lantern and inspect your birds. Listen then for rattling or sneezing. After death, the gall bladder and liver are found full of matter; the flesh is soft, easily broken down; has a very disagreeable smell; it is very shiny and spongy, specially near the lungs. The blood has been carefully examined, but presents no alterations of importance, except that there are, perhaps, fewer white corpuscles, a defect depending on the depression of the power of digestion.

Causes of Roup.—In all the above, there does not seem to be the trace of any special poison; it is like a typhoid influenza, which, when it comes as an epidemic,

will destroy a great many human lives. Cases not treated are generally fatal in three days; some fowls may live seven to eight. Those causes that can be determined do not need enumeration here. Anything that lowers the tone of the fowl—bad ventilation, filthy houses, etc.—will most assuredly cause roup. A very prominent cause, however, is exposure to draughts and wet. So prominent is this, and so marked is the commencement of the disease at the beak, that it might almost be called malignant catarrh, and it is possibly nothing more. Fowls are sometimes destroyed by a cold alone. Roup is most common in autumn and winter, and where fowls are exposed to wet, cold draughts and damp sunless quarters. When fowls are shut up in a crowded, hot and badly ventilated place during the night and let out in the morning into the cold, windy and damp air, they are sure to become ill.

The disease is epidemic and contagious, from contact with the discharge, either when a diseased fowl touches another, or when a healthy fowl gets the discharge through the drinking fountain or otherwise. It can also, if brought into contact with the human eye, or with a wound, cause serious inflammation, so that caution is needed in handling the fowl. It has never been found, so far as we know, in any kind of wild fowl, though it may yet be discovered among them. It attacks all ages, preferably the older birds, and may

run rapidly or slowly. It also kills ducklings and turkey poults, though rarely.

Roup is often caused by fowls picking up the spittle of persons suffering from cold, influenza, consumption, diphtheria, etc. When fowls are kept very close to the habitation of man, or people are allowed to go very frequently among the birds and spit about in the houses and runs, the birds will become ill. It is seldom found among fowls kept in properly constructed pens and runs where people are not often allowed to go.

As soon as the disease is detected, the sick bird must be destroyed, and the other birds in the pen put under treatment. Unless the sick bird is a very valuable one, there is no use trying to doctor it; even if the bird does recover, it will be quite unfitted for the breeding pen. The time and effort spent in treating a sick bird should be applied to treating the birds that are not yet sick but have been exposed to the infection. The pen, run and boxes must be thoroughly washed with Phenyle and water, and when dried rubbed over with tar and kerosene oil. All earthen or wood water vessels and feeding dishes must be destroyed.

Treatment of Wet Roup.—If treatment be adopted, then, by all means put the diseased fowls by themselves and, so far as possible, each one in a separate place, and do not be in a hurry, even after improvement, to return

them to the rest of the flock. If your situation allows of such a measure, break up all the healthy fowls into small colonies, at a distance from each other. Take all possible pains to prevent any of the discharge from coming into contact with any other fowl. This necessarily involves thorough purification of the drinking vessels, and so forth. Some Jeyes' Fluid, Izal, Phenyle or Carbolic acid is best for this purpose. The quarters should be carefully cleaned and disinfected.

The treatment is not always successful. It consist of measures to combat the inconvenience and dangers arising from the accumulation of the discharge, and the administration of medicine internally.

The secret of success is to begin treatment at the very commencement of the disease. The least delay may prove fatal.

For the cold and discharge from the nose and eyes, give internally Acon. 1x, Spongia 3x and Ars. Alb. 1x alternately, one drop every two hours. If the discharge be thick and yellow, give Mer. Cor. 3x and Aconite.

When there is ulceration of the throat, mouth or nostrils, give Belladonna 1x and Mer. Iod. 1x alternately, one or two drops or grains every two hours. Wash the mouth and face with a strong solution of Condy's Fluid or Permanganate of Potash and water, and then paint the ulcerated parts with a strong solution of

Nitrate of Silver. This should be done at least once a day.

When there is much fever and weakness, give Ars. Alb. 1x and Acon. 1x alternately, one drop every two hours.

Another remedy :—

Sulphate of Copper	..	..	one-eighth grain.
Hydostrinc	..	..	one-sixteenth grain.
Balsam of Copaiba	..	..	two grains.
Cayenne Pepper	..	..	two grains.
Calcine of Magnesia	..	..	two grains.
Liquorice Powder	..	..	two grains.
Peepul fruit	..	..	two grains.

Mix with mustard oil and make into four pills—one pill to be given in the morning and one at night.

Put ten drops of Condyl's Fluid or a grain of Permanganate of Potash in half a teaspoonful of water and pour it gently down the bird's throat, or if the nostrils are bad, inject into the nostrils. Do this twice a day.

Press the pus out of the nose, and remove the cankers from the mouth and eyes. Wash the bird's face, eyes and throat with a strong lotion of Condyl's Fluid or Permanganate of Potash and rub Flowers of Sulphur to the parts.

A teaspoonful of Epsom Salts twice a week will do good. If the bird refuses food, make up little balls of

oatmeal or barley-meal and milk, and force them down its throat. The balls must be made small, and only a small quantity given at a time.

The bird must be housed in a warm, dry and properly ventilated place, and kept on a bed of sand. Absolute cleanliness is necessary.

The disease is very contagious and is communicable to human beings. Unless the bird is taken in hand at the very commencement of the disease, there is no hope of recovery. If the bird dies, burn or bury it.

Give the healthy stock five drops of Condry's Fluid and one drop of Liquor Arsenic in half a teaspoonful of water every morning, before the morning-feed, or give some Poultry Powder, or else rub some Eucalyptus oil on the face and nostrils and put some down the throat of each bird.

Recovery will be slow, but the treatment adopted must be persisted in. When the bird has recovered, it must be kept separated from the others for a month, and rubbed over with Rough on Lice before it is put back into the yard.

As a preventive measure the following should be adopted :—Put a pound of pure fresh coal-tar in a vessel with ten pounds of water, stir up well. Allow this to stand for a few days, and then draw off the water and put an ounce of it to every quart of water given to the fowls to drink, or else put some Permanganate of Potash

—sufficient to make the water a deep pink in the drinking water every day.

10. *Canker*.—This is a malignant disease and may be present with roup or may attack a bird that has not that disease. It affects the eyes, head and face, but more generally the mouth and throat. The disease becomes worse until it suffocates the bird. If the bird is not a very valuable one, it should be destroyed and burned or buried with quicklime.

If the bird is to be treated, it should at once be separated from the rest of the birds. The diseased growth must be removed by means of a scoop or forceps, and the affected parts thoroughly washed with a strong solution of Condyl's Fluid or Permanganate of Potash and water; let this go right down into the throat and nostrils. After washing the parts dry with a piece of cloth, apply a little Flowers of Sulphur and Boracic acid powder to the parts; apply it dry and rub it well into the sores or else apply Nitrate of Silver. Give the bird half a teaspoonful of Epsom Salts, and feed on soft food. Add quarter of a teaspoonful of Poultry Powder to the food. Epsom Salts should be given once a week, but the Condyl's Fluid and Flowers of Sulphur and Boracic acid or Nitrate of Silver must be applied twice a day. The coop and everything about the sick fowls must be thoroughly disinfected with Phenyle. Internally give Belladonna 1x, and Mer.

Iod. lx alternately, one drop in a teaspoonful of water every two hours.

THREE TROUBLESOME THINGS.

11. *Egg-eating Fowls: Cause and Cure.*—Not a few poultry-keepers are annoyed by fowls eating their eggs and thus causing the keeping of poultry to be a source of loss instead of pleasure and profit. The chief of the causes of this habit is the accidental breaking of eggs in the hen-house and the fowls not having a sufficiency of shell-forming material. The latter is the most frequently predisposing cause of fowls becoming addicted to egg-eating. When an egg has been accidentally broken in the hen-house, it is very much less likely to be eaten if the fowls are being liberally supplied with shell-forming material. The eggs, too, are very much less liable to become broken when the fowls have an ample supply of shell-forming material, because they would not be so likely to be thin-shelled. However, as a matter of fact, the laying of eggs with thin shells is mostly the result of an over-fat condition. When laying, hens have a strong instinctive craving for shell-forming matter, and then especially they will scramble for a broken-shelled egg. Having once tasted an egg, they are very liable afterwards to peck at any which they may see and should they be thin in shell they would be almost certain to be broken and devoured.

Having broken an egg, they would, after doing so, attack all that they could find with increased determination, and would not fail to break those with thick shells. When a pen of fowls has contracted this habit, the male bird is usually the greatest culprit, and will wait for the egg by a hen all the time that she is on the nest to lay.

Eggs become broken chiefly through their being thin-shelled, or accidentally, and everything should be done to prevent these causes. It has already been pointed out that a deficiency of shell-forming material and an over-fat condition of the hen are the chief causes of the eggs having thin shells, and being consequently very liable to become broken; therefore, in a great measure, prevention lies in supplying an abundance of shell-forming material for the fowls when they are laying, or about to lay, and also in feeding with a diet not likely to cause them to become very fat. In order to prevent eggs becoming accidentally broken, it is necessary to keep the floor of the hen-house covered with some soft material, and especially under the perches. For this purpose a thick layer of sand is very suitable, and besides tending to prevent any eggs becoming broken, the sand, if very dry and clean, which, of course, it should be, would act as a deodorant and keep the hen-house sweet for one or two months without the sand being changed. Sand would also keep the fowls much more comfortable than they would be on a hard floor.

Some persons suppose that sand harbours the parasites that infest fowls, but just the reverse is the case if a little kerosene oil or Phenyle is occasionally sprinkled amongst the sand, for that would destroy them.

Placing the nests for laying in a rather dark corner of the fowl-house or making the house in such a way that it can be darkened during the day, tends to prevent egg-eating, and doing so is also an inducement for the fowls to lay in the nest instead of dropping their eggs about the run, for "Biddy" prefers a secluded place to lay in, and would go to one when she would not trouble to go to a nest in an exposed position. It is an error to place the nests in any position where the eggs can easily be seen, and especially when they are within easy reach of fowls which are not laying. If at all convenient, it is an advantage for the nest to be upon the ground. When the eggs are being eaten, it is not an easy matter to detect the culprit and stop the practice by killing the guilty fowl; and when this cannot be done, it is not an easy matter to stop the practice in other ways, but the following remedial measures may be adopted with considerable hope of success. In the first place, hard dummy eggs should be scattered about the run, and placed in the nests, and they should be kept bright and clean so as to be as nearly like natural ones as it is possible for them to be. Keeping these dummy eggs about, besides tending to stop egg-eating,

is one of the very best means of prevention. To stop the practice, take a few eggs, make a small hole in the side of each, empty them, place the yolks and white in a plate, add a lot of strong mustard and a good quantity of pure Phenyle, mix well. Fill the egg shells with this mixture, and clean up the shells so that none of the stuff will be on them. Close up the holes with gum and paper. Place these filled eggs in the house near the nest, in the nest, and near the door. The egg-eaters will run to these and take a few good mouthfuls, but that will be enough for them; they will learn a lesson and leave the eggs alone. This performance must be repeated for a few days before the birds are cured of the bad habit of eating eggs. If, after such treatment, the fowls are not cured of the vice, then some sort of trap-nest must be devised, by which means the eggs will be removed from the nests as soon as they are laid. If this cannot be done, then the birds guilty of the vice must be removed from the pen and killed.

12. *A Cure for Feather-pulling.*—Feather-pulling is often the result of idleness. Fowls that are well fed and confined, and which have no inducement to scratch, seem to learn the vice. One hen may happen to pull a feather from another by way of diversion. The sweet taste of the blood is satisfactory, and as the hen finds that it can have an unlimited

supply from the other members of the flock, she puts her resolution into practice. Other hens learn from her and soon the entire flock is ruined. If one of these hens is put in with another flock, she teaches them the vice. If one buys such a fowl, there is a liability of bringing the vice into the flock. A feather-pulling flock is almost worthless because it requires more food to produce more feathers, and the supply of eggs falls off correspondingly.

If the hens are very valuable and contract this vice, they may be cured by patient attention. Unfortunately the vice is usually contracted by valuable hens that are confined in pens.

The way to cure a hen of the habit is to cut off, with a sharp knife, the horny edge of the mandibles or upper and lower part of the beak. By carefully cutting this off, at the same time cutting off the sharp end of the upper beak, there will be wedge-shaped opening between the two halves of the beak when the mouth is closed. This prevents them from getting a hold on a feather firm enough to enable them to pull it out. Cutting this horny edge off the beak does not hurt any more than cutting one's finger nails, and it will grow out again in a few weeks, by which time the vice is usually forgotten.

13. *Promoting Moulting.*—The earlier the birds are out of their moult and in full plumage, the sooner they will begin to lay in the autumn. The pullets

usually begin to lay as soon as they are completely plumed and become adult fowls. It is worth while, therefore, to encourage moulting in every way—giving them exercise, insect food or meat in their rations, with ground bone or oyster shell and sound grain. Sunflower seeds, or linseed meal in their food, promotes moulting. A teaspoonful of fine salt in the soft foods given daily to a flock of twenty hens should be allowed.

The editor of *Poultry* uses the same arguments as we do as to the desirability of removing the cock birds from the hens. He writes :—

I have always found it beneficial to separate the sexes during the time of moulting ; and until the fowls are required for the breeding-pen, it is advisable to keep them parted. By adopting such a plan the male birds are rendered more vigorous by the early part of next season : and, moreover, it has the effect of causing the plumage of the females to remain in sound condition throughout the winter.

Although, as I have shown, it is possible to induce a moult, the process cannot be materially hastened by the poultry-keeper. All that should be done is to keep the birds warm and well fed. But as stimulating food causes fever, and thus prevents the formation of feathers, the diet should be of a cooling nature.

As to suitable food, the following will answer : Oats and wheat together in equal quantities ; peas and

beans ; lean meat ; fresh raw bones cut or well broken ; ground oats and fine sharps, or ground wheat mixed with skim milk ; all are good. Where fowls are kept in close confinement it will be found very beneficial to give them lettuce that has gone to seed and is stalky, sods of growing grass, and heaps of fresh mould. Such foods as maize, rice or their equivalents, and, above all, hemp seed, should be strictly excluded from the diet.

When the weather is bright, a small quantity of sulphur (about a teaspoonful to a quart of soft food) may be sprinkled in the morning meal ; and heaps of coal ashes thrown into the bird's haunts are greatly relished. Warmth and dryness are the great things to observe ; and avoid letting the birds catch cold. The well-known Douglas's Mixture may be given to the fowls if a tonic is needed.

The following advice given by Mr. H. deCourcy in *Farm and Garden* may well be considered :—Early moulting is desirable, he writes, in order that the hen may get through this critical period of her life while the weather is warm, and may be ready to devote all her energies to autumn and winter laying. Accordingly, those sections of experiment, reports relating to several moulting trials which have been made are of special interest and very great value to poultry-keepers. It is very seldom that a hen continues to lay during her moult, and it is undesirable also that she should do so,

for all her energies ought now to be devoted to the casting off the old covering and the assumption of a new coat to do duty for another year of hard work. Moulting ought to take place in late summer or early autumn, and the earlier the better; and it may be brought about by a special course of feeding and general treatment, which seems to have been discovered and first made public by Mr. H. van Dresser, a practical breeder of farm poultry. The system recommended by him was to starve the birds for several days, giving them only as much food as would keep them alive, and thus to stop laying and reduce weight; then to feed liberally on foods calculated to promote the growth of feathers. The "van Dresser" method, as it is known, was taken up by the West Virginia Experiment Station, with the object of putting it through a series of thorough tests, the fowls used being White Leghorns and Rhode Island Reds. The trials commenced on 5th August of last year, and all food was withheld from the birds for a period of thirteen days, except what they could pick up off the pastures of yards one hundred feet long and fifteen feet wide. After seven days of starvation treatment the hens ceased laying entirely and at the end of thirteen days they were again fed liberally on mash, beef scraps, maize, wheat and oats. After thirty days the moult was completed, and every hen had an entirely new coat. From this time it only took a week until

many of the hens were in full lay, and half the flock or more was laying within a fortnight. For the purpose of comparison other hens were fed regularly all the time, and they continued laying spasmodically, and did not begin to moult until the hens which had been starved had completely moulted and were again in full lay. The results of this experiment are fully confirmed by the report of the Canada Central Experiment Station, where Professor A. G. Gilbert had the allowance of laying hens reduced by one half for the first three weeks in July with the result that laying was soon stopped and moulting begun, and by the middle of September the hens had assumed complete coats of new feathers and were laying steadily. The hens did not begin to cast their feathers until liberal feeding was resumed towards the end of July. There is no reason to doubt that the methods reported may be applied in this country with equally good results, and if properly carried out the system should help the solution of the winter egg problem ; for the great advantage of securing an early moult is that the hens are in excellent condition to begin laying just when eggs are beginning to get scarce.

RECIPES.

1. TONIC POULTRY POWDER.—To be given during the rains and cold weather only ; not in the hot weather—

Charcoal	..	..	..	five seers.
Black Salt	..	..	..	half a seer.
Linseed	..	..	..	five seers.
Hempseed	..	..	..	one seer.
Cayenne Pepper	..	..	..	half a seer.
Turmeric	..	..	..	two seers.
Camphor	..	..	..	quarter seer.
Chiretta	..	..	..	half a seer.
Ginger	..	..	..	one seer.
Sulphate of Iron	..	..	..	two chittacks.
Sulphur	..	..	..	one seer.

Each ingredient to be finely ground separately, and then all to be thoroughly mixed together.

A quarter of a teaspoonful to be given to each fowl, every morning, in small pills or in the food. Give for a week and then stop for a week.

During the hot weather give the following :—

Charcoal	..	..	..	five seers.
Black Salt	..	..	..	quarter seer.
Camphor	..	..	..	quarter seer.
Chiretta	..	..	..	quarter seer.
Sulphate of Iron	..	..	..	one-eighth seer.
Sulphur	..	..	..	half a seer.
Treacle	..	..	..	three seers.

Grind finely and mix together thoroughly. Give half teaspoonful to a fowl every morning for a week or so and then stop for two weeks or more.

2. TONIC MIXTURE.—For weak leg and debility :—

Sulphate of Iron	..	..	sixteen grains.
Strychnine	..	..	quarter grain.
Phosphate of Lime	..	..	eighty grains.
Sulphate of Quinine	..	..	eight grains.
Tincture of Gentian	..	..	two drams.

To be made into 32 doses. One to be given every day.

3. QUININE MIXTURE.—For simple colds and fever.

Quinine	..	..	half grain.
Sulph. Acid (dil.)	..	..	one drop.
Tincture of Steel	..	..	one drop.

To be given once a day in half an ounce of water.

4. DOUGLAS'S MIXTURE.

Sulphate of Iron	..	..	quarter of a pound.
Sulph. Acid (dil.)	..	..	quarter of an ounce.
Water	..	..	one quart.

One ounce of this mixture to be given to every half gallon of drinking-water.

5. ROUGH ON LICE.—Have some fresh cowdung made into cakes and dried in the sun. Do not allow any straw or wood to be mixed with the cowdung. When the cakes are properly dried, have them burned. When the ashes are still black, before they become white,

have them removed from the fire and kept on one side. No water must be put on the ashes. When cool, the ashes must be sifted through a fine flour sieve.

Take some fresh strong tobacco leaves. The country tobacco the people call *balati* is the best. Dry in the sun and pound into powder ; pass through a fine flour sieve.

Take two seers of the prepared coddung ashes ; add one and half chittack or 3 ounces of pure Phenyle to it ; mix and rub the whole thoroughly until the Phenyle is properly mixed up with the ashes. To this add one seer of the prepared tobacco ; mix properly until the ashes and tobacco are thoroughly mixed together. To this add half a pound of Flowers of Sulphur ; mix properly.

When prepared, put into bottles or tins and cork tightly until wanted for use. This powder should be applied to all parts of a fowl affected with lice.

When needed for chickens, only half the quantity of Phenyle and tobacco should be used.

Another way of making insect powder :—Take six pounds of finely sifted coal ashes, one pound of Flowers of Sulphur, four ounces of Petroleum and four ounces of Phenyle. Mix the ashes and Sulphur together, and mix the Petroleum and Phenyle together ; then mix the whole together thoroughly.

For very small chickens, Keating's Insect Powder should be used.

When applying the powder to the bird, it should be held on a large sheet of paper or a sheet of tin, and as the lice fall on the paper, they should be destroyed by fire.

6. LICE LOTION.—(1) Napthaline one ounce, Methylated spirits one ounce, Cocoanut oil seven ounces. The following can be applied to large chickens and adult birds. (2) Kerosene oil two ounces, Phenyle one dram, Cocoanut oil seven ounces ; put in a bottle and shake up well until properly mixed. (3) Turpentine one ounce, Eucalyptus oil one ounce, Camphor half ounce, Cocoanut oil seven ounces. Apply to the bird with a soft rag.

7. MIXTURE FOR BUGS, TICKS AND LICE.—To be applied to all wood and bamboo work. One part of Coal-tar to seven parts of Kerosene oil, well stirred until most of the tar is dissolved. Stockholm tar is preferable to Coal-tar for coops, cages and nests. Apply liberally to all coops, boxes, perches, doors, posts, walls, etc., put into all cracks and crevices in wood or wall.

8. PHENYLE POWDER.—Take ten pounds of sifted ashes, add a pound of Little's Soluble Phenyle and mix thoroughly. Sprinkle the house and shed with this, and put on the floor of the coops. Only the best Phenyle must be used.

9. KEROSENE OR PETROLEUM POWDER.—Take two seers of Kerosene or Petroleum oil, add quarter of a seer of Coal-tar, stir thoroughly. Place 20 seers of clean sand in a tub and pour the prepared Kerosene oil on this and mix properly, sprinkle this on the floor of the house and yard; all the lice will disappear.

10. WHITEWASH.—Take two seers of unslaked Lime, put into a large bucket; on this gently pour eight seers of hot water; when slaked, add one pound of crude Carbohc acid and stir thoroughly. Apply to the mud or brick walls while still hot.

11. DUST-BATHS.—Dig a hole 12 inches deep and 3 feet in diameter in a high part of the run or shed, fill with sifted cowdung ashes or coal ashes. Add half a pound of Flowers of Sulphur and half a pound of Napthalene and mix with the ashes. Bury some dry tobacco leaves in the ashes.

12. FUMIGATING WITH SULPHUR.—Make a bright charcoal fire in a small country *choola* or *ungati*, put this in the room, close up all the doors and windows and make the place air-tight, place a large tin or iron pan on the fire, place a lot of coarsely ground Sulphur on the pan and get out of the room as quickly as possible. Keep the room shut up for six hours.

13. CONDY'S FLUID.—Put quarter ounce of Permanganate of Potash crystals into a quart of

water. Shake the bottle till the crystals dissolve. The solution can be made weaker by adding water.

14. SULPHUR.—Sulphur ground into very fine powder and added to the food during the hot weather is a very good thing for fowls. It must not be given during wet, damp and cold weather.

A teaspoonful of ground Sulphur given in soft food will be sufficient for 16 fowls or 32 chickens.

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